

1628E02

HYDROGEOLOGIC STUDY
OF
FRESHWATER AQUIFER
AND
DEEP GEOLOGIC FORMATIONS
SARNIA, ONTARIO

VOLUME II
APPENDICES

MARCH 1992



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HYDROGEOLOGIC STUDY OF
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APPENDICES

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Detroit, St. Clair, St. Mary's Rivers
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APPENDIX A

Geologic and Hydrogeologic Data
from
Earlier Studies

APPENDIX A1

Hydrogeologic Data
- CN Tunnel

(after Hatch Associates Ltd.,
Golder Associates Ltd., 1985)

Figure A1-1 Geologic Section of CN Tunnel (after Hatch Golder, 1985)

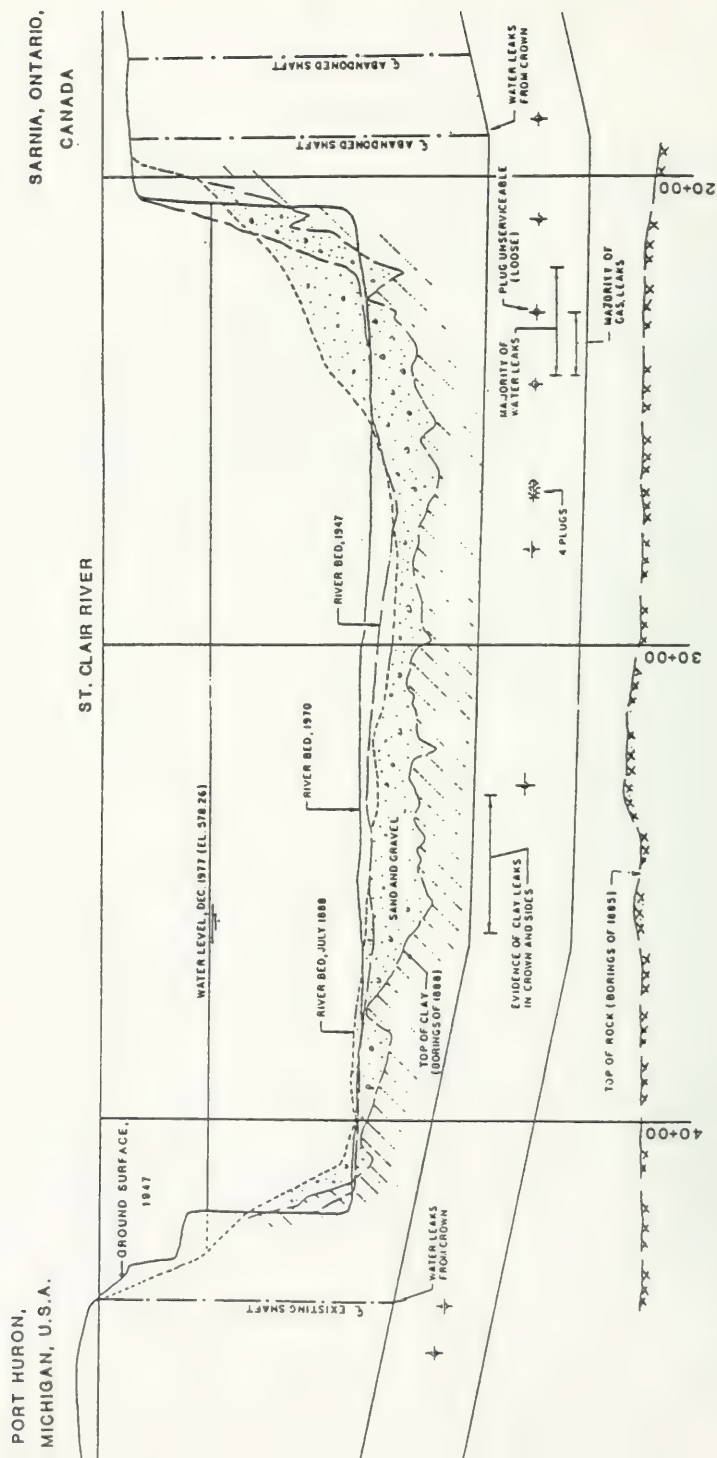


Figure A1-2

LOCATION SKETCHES OF PIEZOMETER INSTALLATIONS

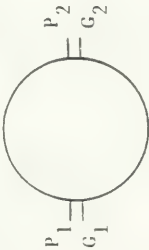
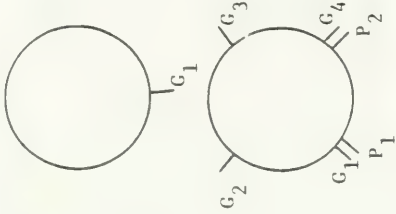
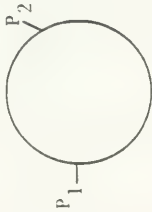
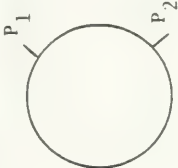
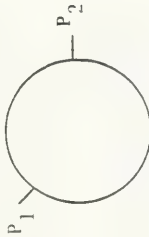
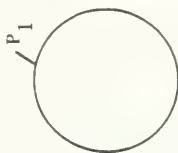

| Approximate Location of Installation | Approximate Position of Instrument (looking west in tunnel) | Approximate Location of Installation | Approximate Position of Instrument (looking west in tunnel) |
|---|---|---|--|
| (STATION) | | (STATION) | |
| 35+00 |  | 24+48 |  |
| 30+50 |  | 24+10 |  |
| 27+20 |  | 22+70 |  |
| 24+70 |  | 19+60 | |

Table A1-1 Summary of Calculated Hydraulic Conductivities and Inferred Stratigraphy Around CN Tunnel

| 1985 Station | Piezometer | Average Pressure Head (m) | Oct./78 | May/79 | July/81 | June/82 | July/83 | Aug./85 | Inferred Stratigraphy |
|------------------------------------|------------|---------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------------------|
| Calculated Hydraulic Conductivity* | | | | | | | | | |
| 19+60 | P1 | 21 | 5×10^{-7} | 9×10^{-7} | 1×10^{-5} | --- | --- | --- | sand and gravel |
| | P2 | 24 | --- | --- | 7×10^{-10} | 4×10^{-10} | 5×10^{-10} | 2×10^{-10} | silty clay till |
| 22+70 | P1 | 24 | 2×10^{-6} | 2×10^{-6} | 1×10^{-5} | 7×10^{-6} | 7×10^{-6} | 7×10^{-6} | sand and gravel |
| | P2 | 16 | 1×10^{-8} | 1×10^{-6} | --- | 7×10^{-10} | 2×10^{-8} | 2×10^{-9} | silty sand |
| 24+10 | W1 | 22 | --- | --- | -- | 3×10^{-6} | 7×10^{-6} | 1×10^{-5} | sand and gravel |
| | P1 | 19 | 3×10^{-10} | 2×10^{-10} | 3×10^{-10} | 2×10^{-10} | 3×10^{-10} | 2×10^{-10} | silty clay till |
| | P2 | 18 | gas | gas | 2×10^{-6} | 5×10^{-6} | 1×10^{-5} | 1×10^{-5} | sand and gravel |
| | G1 | 18 | 7×10^{-7} | 2×10^{-6} | 8×10^{-8} | 5×10^{-9} | 1×10^{-6} | 3×10^{-7} | silty sand |
| | G2 | 13 | 1×10^{-9} | 2×10^{-10} | 9×10^{-11} | 3×10^{-10} | 6×10^{-10} | 2×10^{-10} | silty clay till |
| | G3 | 15 | 3×10^{-9} | 2×10^{-10} | 1×10^{-10} | 4×10^{-10} | 1×10^{-10} | 2×10^{-10} | silty clay till |
| 24+48 | G4 | 19 | 6×10^{-7} | 1×10^{-6} | 1×10^{-10} | 6×10^{-10} | 1×10^{-8} | 2×10^{-9} | silt |
| | G1 | 20 | 5×10^{-10} | 5×10^{-10} | --- | --- | --- | --- | silty clay till |
| 24+70 | P1 | 17 | 1×10^{-6} | --- | 4×10^{-6} | 2×10^{-6} | 2×10^{-6} | 8×10^{-7} | silty sand |

Table A1-1 Summary of Calculated Hydraulic Conductivities and Inferred Stratigraphy Around GW Tunnel (cont'd)

| 1985 Station | Piezometer | Average Pressure Head (m) | Calculated Hydraulic Conductivity* | | | | | | Inferred Stratigraphy |
|-----------------|------------|---------------------------------|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------------------|
| | | | Oct./78 | May/79 | July/81 | June/82 | July/83 | Aug./85 | |
| 27+20 | P1 | 8 | 3×10^{-9} | 2×10^{-10} | 4×10^{-10} | 4×10^{-10} | 4×10^{-10} | 4×10^{-10} | silty clay till |
| | P2 | 3 | DRY | 9×10^{-10} | --- | --- | 2×10^{-9} | 1×10^{-9} | silty clay till |
| | P1 | 8 | DRY | 2×10^{-10} | 5×10^{-10} | 2×10^{-10} | 3×10^{-10} | 8×10^{-11} | silty clay till |
| 30+50 | P2 | 8 | 5×10^{-9} | 3×10^{-10} | 2×10^{-10} | 1×10^{-10} | 1×10^{-10} | 3×10^{-10} | silty clay till |
| | P1 | 9 | 1×10^{-9} | 3×10^{-10} | 2×10^{-10} | 2×10^{-10} | 2×10^{-10} | 1×10^{-10} | silty clay till |
| | P2 | 22 | 5×10^{-10} | 1×10^{-10} | 8×10^{-11} | 8×10^{-11} | 8×10^{-11} | 4×10^{-11} | silty clay till |
| 35+00 | G1 | 15 | 7×10^{-10} | 4×10^{-10} | 2×10^{-10} | 2×10^{-10} | 2×10^{-10} | 2×10^{-10} | silty clay till |
| | G2 | 40 | 5×10^{-10} | 1×10^{-10} | 9×10^{-11} | 8×10^{-11} | 8×10^{-11} | 8×10^{-11} | silty clay till |

*Assuming steady radial flow to piezometer of length 0.20 m, radius 20 mm and withdrawal head equal to average pressure head

Table A1-2 Summary of 1985 Water Quality Data* - CN Tunnel
(from Hatch Associates - Golder Associates, 1985)

| <u>New Station</u> | | <u>pH</u> | <u>Chloride Cl</u> | <u>Sulfate SO₄</u> | <u>Total Fe</u> | <u>Phenols</u> | <u>TOC</u> |
|--------------------|----------------|-----------|------------------------|-----------------------------------|---------------------|----------------|------------|
| 35+00 | P1 | 8.3 | 80 | 2 | <0.05 | - | - |
| | G1 | 8.2 | 175 | 2 | <0.05 | <0.02 | <0.5 |
| | P2 | 8.3 | 80 | 10 | - | - | - |
| | G2 | 8.2 | 65 | 20 | <0.05 | <0.02 | <0.5 |
| 30+50 | P1 | 8.6 | 100 | 15 | 0.15 | <0.02 | - |
| | P2 | 8.2 | 35 | 30 | - | - | - |
| 27+20 | P1 | 8.3 | 185 | 5 | <0.05 | <0.02 | - |
| | P2 | 8.1 | 800 | 20 | <0.05 | <0.02 | - |
| 24+70 | P1 | 8.3 | 1300 | 11 | 0.19 | 0.52 | <0.5 |
| 24+10 | P1 | 8.2 | 280 | 11 | 0.24 | 0.03 | <0.5 |
| | G1 | 8.0 | 155 | 2 | 0.30 | <0.02 | <0.5 |
| | P2 | 7.6 | 6000 | 14 | 3.00 | 0.15 | 5.0 |
| | G2 | 7.9 | 70 | 126 | 0.08 | <0.02 | - |
| | G3 | 8.3 | 40 | 4 | <0.05 | <0.02 | - |
| | G4 | 8.0 | 6000 | 14 | 0.52 | 0.12 | 8.0 |
| 22+70 | P1 | 7.2 | 10 | 16 | 1.85 | <0.02 | <0.5 |
| | P2 | 8.1 | 435 | 2 | <0.05 | <0.02 | <0.5 |
| | Well* Point | 7.1 | 15 | 33 | 1.24 | <0.02 | <0.5 |
| 19+60 | P1 | - | - | - | - | - | - |
| | P2 | 4.8 | 600 | 16 | 7.60 | 0.03 | 4.5 |

*All results in mg/L

APPENDIX A2

Water Quality of Domestic Wells
in Sarnia and Moore Townships
Lambton County

Fresh Water Aquifer

Analysis for: Sodium, Chloride, Conductivity,
Dissolved Organic Carbon, Phenol

Sampling and Analysis performed by
Ontario Ministry of the Environment

Table A2-1 Water Quality Results, Domestic Wells in Sarnia and Moore Townships, Lambton County (cont'd)

| Well Owner | Township | Sampling Date | Na mg/L | Cl mg/L | Conductivity umhos | DOC mg/L | Phenol ug/L |
|------------|----------|---------------|---------|---------|--------------------|----------|-------------|
| Brown | Sarnia | Nov. 1985 | 255 | 248 | 1470 | 0.6 | <1.0 |
| | | July 1984 | 265 | 245 | 1470 | 1.3 | <1.0 |
| | | May 1983 | — | 240 | 1350 | — | <1.0 |
| | | Oct. 1982 | — | 280 | 1340 | — | <1.0 |
| | | March 1981 | 270 | 285 | 1410 | — | 7.0 |
| | | May 1980 | 276 | 300 | 1400 | — | <1.0 |
| Huizenga | Sarnia | July 1984 | 420 | 560 | 2450 | 0.8 | <1.0 |
| | | May 1983 | — | 650 | 2390 | — | <1.0 |
| | | Oct. 1982 | 405 | 640 | 2370 | — | <1.0 |
| | | Sept. 1981 | 425 | 630 | 2390 | — | <1.0 |
| | | May 1980 | 400 | 670 | 2420 | — | <1.0 |
| Iam | Sarnia | Nov. 1985 | 580 | 860 | 3370 | 0.1 | <1.0 |
| | | July 1984 | 555 | 615 | 3150 | 0.9 | <1.0 |
| | | May 1983 | — | 790 | 2890 | — | <1.0 |
| | | Oct. 1982 | 550 | 770 | 2870 | — | <1.0 |
| | | March 1981 | 520 | 730 | 2700 | — | <1.0 |
| | | May 1980 | 530 | 790 | 2790 | — | <1.0 |
| McHenery | Sarnia | Nov. 1985 | 310 | 382 | 1850 | <1.0 | <1.0 |
| Pulyk | Sarnia | Nov. 1985 | 240 | 240 | 1320 | 1.1 | <1.0 |
| | | July 1984 | 255 | 232 | 1260 | 1.6 | <1.0 |
| | | May 1983 | — | 262 | 865 | — | <1.0 |
| | | Oct. 1982 | 250 | 260 | 1280 | — | <1.0 |
| | | March 1981 | 248 | 260 | 1270 | — | <1.0 |
| | | May 1980 | 250 | 275 | 1270 | — | 1.0 |
| Sanivan | Sarnia | Nov. 1985 | 210 | 152 | 1140 | 1.3 | 1.0 |
| | | July 1984 | 210 | 155 | 1080 | 1.7 | <1.0 |
| Wright | Sarnia | Nov. 1985 | 220 | 205 | 1220 | 1.3 | <1.0 |
| | | July 1984 | 240 | 185 | 1220 | 1.6 | <1.0 |
| | | May 1983 | — | 230 | 1210 | — | <1.0 |
| | | Oct. 1982 | — | 240 | 1210 | — | <1.0 |
| | | March 1981 | 246 | 240 | 1250 | — | <1.0 |
| | | May 1980 | 250 | 270 | 1280 | — | <1.0 |

— Analysis not performed

Source: Ministry of the Environment (London) Laboratories

Table A2-1 Water Quality Results, Domestic Wells in Sarnia and Moore Townships, Lambton County (cont'd)

| Well Owner | Township | Sampling Date | Na mg/L | Cl mg/L | Conductivity umhos | DOC mg/L | Phenol ug/L |
|------------|----------|---------------|---------|---------|--------------------|----------|-------------|
| Allingham | Moore | Nov. 1985 | 155 | 120 | 905 | 2.0 | <1.0 |
| | | July 1984 | 150 | 130 | 885 | 2.1 | <1.0 |
| | | May 1983 | — | 130 | 1120 | — | <1.0 |
| | | Oct. 1982 | — | 135 | 885 | — | <1.0 |
| | | Sept. 1981 | 172 | 122 | 870 | — | <1.0 |
| | | June 1980 | 173 | 135 | 870 | — | <1.0 |
| Braaksma | Moore | Nov. 1985 | 275 | 235 | 1470 | 0.7 | <1.0 |
| | | July 1984 | 286 | 198 | 1410 | 1.0 | <1.0 |
| | | Oct. 1982 | — | 225 | 1360 | — | <1.0 |
| Bugler | Moore | Nov. 1985 | 220 | 188 | 1140 | 1.2 | <1.0 |
| Grigg | Moore | Nov. 1985 | 200 | 220 | 1200 | 0.9 | <1.0 |
| | | July 1984 | 218 | 205 | 1150 | 1.5 | <1.0 |
| Leckie | Moore | July 1984 | 256 | 300 | 1410 | 1.0 | 1.5 |
| | | May 1983 | — | 335 | 1160 | — | <1.0 |
| | | Oct. 1982 | — | 325 | 1385 | — | <1.0 |
| | | Sept. 1981 | 254 | 300 | 1380 | — | <1.0 |
| | | May 1980 | 248 | 330 | 1370 | — | <1.0 |
| Long | Moore | Nov. 1985 | 205 | 180 | 1080 | 1.1 | <1.0 |
| | | July 1984 | 200 | 205 | 1160 | 1.1 | <1.0 |
| | | May 1983 | — | 200 | 1700 | — | <1.0 |
| | | March 1982 | 178 | 158 | 950 | — | <1.0 |
| | | Sept. 1981 | 208 | 175 | 1110 | — | <1.0 |
| | | June 1980 | 210 | 205 | 1140 | — | <1.0 |
| Manley | Moore | Nov. 1985 | 290 | 330 | 1770 | 0.5 | <1.0 |
| | | July 1984 | 300 | 340 | 1700 | 1.0 | <1.0 |
| | | May 1983 | — | 370 | — | — | <1.0 |
| | | Feb. 1982 | 292 | 350 | 1660 | — | <1.0 |
| | | Sept. 1981 | 298 | 325 | 1660 | — | <1.0 |
| | | June 1980 | 315 | 360 | 1720 | — | <1.0 |
| Robinson | Moore | Nov. 1985 | 570 | 705 | 2940 | 0.3 | <1.0 |
| | | July 1984 | 675 | 690 | 3050 | 0.6 | <1.0 |
| | | Oct. 1982 | — | 800 | 3000 | — | <1.0 |

— Analysis not performed

Source: Ministry of the Environment (London) Laboratories

Table A2-1 Water Quality Results, Domestic Wells in Sarnia and Moore Townships, Lambton County (cont'd)

| Well Owner | Township | Sampling Date | Na mg/L | Cl mg/L | Conductivity umhos | DOC mg/L | Phenol ug/L |
|-------------|----------|---------------|---------|---------|--------------------|----------|-------------|
| Sheppard | Moore | Nov. 1985 | 235 | 228 | 1340 | 1.4 | <1.0 |
| | | July 1984 | 610 | 910 | 3700 | — | <1.0 |
| | | Oct. 1982 | — | 275 | 1310 | — | <1.0 |
| | | Sept. 1981 | 262 | 235 | 1330 | — | <1.0 |
| | | June 1980 | 255 | 260 | 1340 | — | <1.0 |
| Snell | Moore | Nov. 1985 | 500 | 68 | 2700 | <0.1 | <1.0 |
| | | July 1984 | 435 | 700 | 830 | 0.3 | <1.0 |
| | | May 1983 | — | 1030 | 1720 | — | <1.0 |
| | | Oct. 1982 | — | 710 | 2550 | — | <1.0 |
| | | Sept. 1981 | 470 | 695 | 2550 | — | <1.0 |
| South | Moore | June 1980 | 435 | 705 | 2580 | — | <1.0 |
| | | Nov. 1985 | 200 | 180 | 1150 | 0.1 | <1.0 |
| | | July 1984 | 2.8 | 2.5 | 144 | 3.1 | 2.0 |
| | | May 1983 | — | 190 | 1095 | — | <1.0 |
| | | Oct. 1982 | — | 11.0 | 450 | 2.2 | <1.0 |
| Vandersteen | Moore | Nov. 1985 | 310 | 252 | 1565 | 1.4 | <1.0 |
| | | July 1984 | 328 | 205 | 1550 | 1.4 | <1.0 |
| | | May 1983 | — | 260 | 2560 | — | <1.0 |
| | | Oct. 1982 | — | 17.0 | 366 | 1.7 | <1.0 |
| | | Sept. 1981 | 338 | 250 | 1550 | — | <1.0 |
| White G. | Moore | June 1980 | 355 | 270 | 1570 | — | 1.5 |
| | | Nov. 1985 | 695 | 1100 | 4150 | — | <1.0 |
| | | July 1984 | 720 | 1120 | 4250 | — | <1.0 |
| | | May 1983 | — | 1240 | 4150 | — | <1.0 |
| | | Oct. 1982 | — | 1240 | 4100 | — | <1.0 |
| White R.M. | Moore | Sept. 1981 | 780 | 1280 | 4350 | — | <1.0 |
| | | June 1980 | 755 | 1270 | 4270 | — | <1.0 |
| | | Nov. 1985 | 280 | 248 | 1400 | 0.9 | <1.0 |
| White R.M. | Moore | July 1984 | 300 | 210 | 1520 | 1.0 | 1.5 |
| | | May 1983 | — | 280 | 1480 | — | <1.0 |

— Analysis not performed

Source: Ministry of the Environment (London) Laboratories

APPENDIX A3

Water Chemistry of Permeable Limestone Layer at
72-74 m depth - Hamilton Group
(after Gartner Lee and Associates Ltd., 1987)

TABLE A3-1

PUMPING TEST SAMPLE ANALYSES
THE HAMILTON GROUP OF FORMATIONS
DUPLICATE SAMPLES FOR EACH SAMPLING PERIOD

Analysis

| Sampling Time, h | 0 | | 1 | | 8 | |
|-------------------------------|-------|-------|-------|-------|-------|-------|
| Sample ID. | A-1 | A-2 | B-1 | B-2 | C-1 | C-2 |
| pH | 8.86 | 8.79 | 8.39 | 8.29 | 7.80 | 7.81 |
| Conductivity, μ mhos | 31000 | 31000 | 37000 | 36000 | 22000 | 22000 |
| Phenol, wppm | 14 | 14 | 14 | 14 | 10 | 10 |
| Total Dissolved Solids, wt% | 3.4 | 3.3 | 4.0 | 4.1 | 2.3 | 2.0 |
| Total Suspended Solids, wppm | 2168 | 2058 | 1368 | 648 | 240 | 390 |
| Ammonia, wppm | 18.2 | 19.1 | 23.7 | 21.4 | 13.5 | 12.8 |
| Oil/Grease, wppm | 4.5 | 5.0 | 4.5 | 3.8 | 2.3 | 2.0 |
| H ₂ S, wppm | 89 | 90 | 100 | 101 | 153 | 153 |
| RSH, wppm | 5 | 4 | 1 | 1 | 3 | 2 |
| Antek Nitrogen, wppm | 19 | 17 | 19 | 21 | 7 | 7 |
| Alkalinity (to pH 4.2), wppm | 547 | 560 | 431 | 420 | 175 | 163 |
| Chlorides, wppm | 203 | 210 | 243 | 245 | 70 | 71 |
| Total Carbon, wppm | 67 | 60 | 74 | 82 | 43 | 53 |
| Total Inorganic Carbon, wppm | 3 | 1 | 2 | 1 | 6 | 12 |
| Total Organic Carbon, wppm | 64 | 59 | 72 | 81 | 37 | 41 |
| Anions, wppm | | | | | | |
| F ⁻ | - | - | - | - | - | - |
| PO ₄ ³⁻ | - | - | - | - | - | - |
| Br ⁻ | 19 | 18 | 30 | 31 | 10 | 9 |
| NO ₃ ⁻ | 15 | 15 | 21 | 31 | <10 | <10 |
| SO ₄ ²⁻ | 1840 | 1840 | 2300 | 2600 | 860 | 820 |

- indicates not detectable

- Sampled on 86-07-05

Note: RSH = mercaptans

TABLE A3-1 PUMPING TEST SAMPLE ANALYSES
 (cont'd) THE HAMILTON GROUP OF FORMATIONS
 DUPLICATE SAMPLES FOR EACH SAMPLING PERIOD

| DUPLICATE SAMPLES FOR EACH SAMPLING PERIOD | | | | | | |
|--|-------|-------|-------|-------|-------|-------|
| Sampling Time, h | 0 | | 1 | | 8 | |
| Sample ID. | A-1 | A-2 | B-1 | B-2 | C-1 | C-2 |
| <u>Metals</u> | | | | | | |
| Ag | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Al | <0.10 | 0.55 | 1.54 | 0.64 | 0.85 | 1.00 |
| B | 0.28 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Ba | 0.80 | 1.15 | 1.37 | 0.94 | 1.61 | 1.43 |
| Ca | 553.5 | 597.0 | 625.5 | 603.0 | 399.4 | 390.8 |
| Cd | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Co | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Cr | <0.10 | <0.10 | 0.14 | 0.14 | 0.23 | 0.20 |
| Cu | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Fe | <0.10 | 0.20 | <0.10 | 0.13 | 0.13 | 0.82 |
| Ir | 0.80 | <0.10 | <0.10 | 0.22 | 0.16 | <0.10 |
| K | 84.0 | 81.4 | 91.0 | 90.1 | 38.1 | 42.2 |
| Mg | 382.0 | 380.5 | 453.0 | 500.5 | 311.0 | 298.0 |
| Mn | 0.37 | 0.40 | 0.58 | 0.33 | 0.34 | 0.41 |
| Mo | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Na | 8960 | 9100 | 10235 | 11710 | 5525 | 5155 |
| Ni | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| P | 0.70 | <0.10 | 0.18 | <0.10 | <0.10 | 0.29 |
| Pb | 0.10 | 3.14 | 1.26 | 1.11 | 2.96 | 1.43 |
| Pd | <0.10 | 0.14 | <0.10 | 0.25 | <0.10 | 0.15 |
| Pt | <0.10 | 0.24 | <0.10 | 0.19 | <0.10 | <0.10 |
| Si | 5.90 | 4.19 | 3.59 | 2.79 | 3.98 | 3.57 |
| Sn | <0.10 | <0.10 | <0.10 | <0.10 | 0.24 | 0.16 |
| V | 0.24 | 0.19 | 0.15 | <0.10 | 0.18 | <0.10 |
| Zn | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | 0.14 |
| As | <0.10 | <0.10 | 0.14 | <0.10 | <0.10 | <0.10 |
| Be | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Ti | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |
| Se | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 | <0.10 |

APPENDIX A4

Water Chemistry of Detroit River Group
(after Gartner-Lee and Associates Ltd., 1987)

TABLE A4-1 WATER CHEMISTRY OF DETROIT RIVER GROUP (AFTER GLAL, 1987)

| WELL | DEPTH (m) | HARDNESS | TOTAL SOLIDS | IRON | SODIUM | POTASSIUM | CALCIUM | MAGNESIUM | TOTAL HALIDES (AS SILVER HALIDE) | SULPHATE | SULPHATE | H ₂ S | BICARBONATE ALKALINITY | PHENOLS (mg/L) | PH | CHLORIDES | ALKALINITY | SPECIFIC GRAVITY | REFERENCE |
|--|-----------|----------|--------------|------|--------|-----------|---------|-----------|----------------------------------|----------|----------|------------------|------------------------|----------------|-----|-----------|------------|------------------|---|
| CIL DISPOSAL WELL #1 (1968) | 238 | | 56,740 | NIL | 11,500 | 146 | 2,600 | 1,440 | 108,200 | 2,120 | 6 | | 105 | | 7.6 | | | 1.036 | McLean, 1968 |
| LOT 2, CON. 15 SOMBRA TWP. | 259 | | 65,446 | NIL | 15,600 | 220 | 2,400 | 1,920 | 131,700 | 2,200 | 16 | | 202 | | 7.2 | | | 1.041 | McLean, 1968 |
| | 303 | | 378,878 | NIL | 41,000 | 2100 | 16,160 | 5,208 | 421,800 | 860 | 150 | | 99 | | 6.6 | | | 1.146 | McLean, 1968 |
| IMP. SOMBRA 8-XIV (1963) LOT 8, CON. 14 | 222 | | 114,310 | NIL | 30,560 | | 5,702 | 2,897 | -- | 872 | | NIL | 55 | | 6.9 | 65,000 | | 1.075 | McLean, 1968 |
| IMP. SARNIA INDIAN RESERVE #1 WELL (-1961) | 198 | | | | | | | | | | | <0.1 | | 6000 | 7.3 | 28,000 | | | Esso files |
| SOURCE UNKNOWN | 7 | 10,640 | | 80 | | | | | | 1,850 | | | | NIL | 9.6 | 15,900 | 1,190 | | Contained in an application submitted to the MOE by W. Glover for a CDL Disposal Well in Lot 7, Con. XI Moore, 1961 |
| CDL DISPOSAL WELL #2 (1911) | 168 | | 26,190 | 4.2 | 6,060 | | 1,688 | 1,025 | | | | <0.04 | | | 6.8 | 13,420 | | | Analysis by J.P. McLean Ltd., 1971 |

NOTE: Analyses in mg/L unless otherwise stated

• Na + K

APPENDIX A5

Average Concentrations of Wastes Injected
into the Detroit River Group of Formations

| | |
|------------|------------------------|
| Table A5-1 | Esso (from GLAL, 1987) |
| Table A5-2 | Sun Oil |
| Table A5-3 | Shell Canada |
| Table A5-4 | Polymer Corp. |

Water Quality Analyses from Flowing Wells

| | |
|------------|--------------------------|
| Table A5-5 | Capital Theatre and Esso |
| Table A5-6 | Esso Rock Wells |
| Table A5-7 | Port Huron, Michigan |

TABLE A5-1

AVERAGED CONCENTRATIONS OF WASTES INJECTED INTO
THE DETROIT RIVER GROUP OF FORMATIONS - ESSO (from GLAL, 1987)

| CHEMICAL PARAMETERS | DISPOSAL WELL #1 | | | | | |
|--------------------------|------------------|------------|--------|-------|--------|--------|
| (Concentrations in mg/L) | 1966 | 1967 | 1969 | 1970 | 1971 | 1972 |
| H ₂ S | 1200 | 1200 | | | | |
| pH | 12.0-12.8 | 12.0-12.8 | | | | |
| phenols | 100 | 100 | | | | |
| HCN | 0 | 0 | | | | |
| Alkalinity | 6000-12000 | 6000-12000 | | | | |
| Sodium (Na) | 12-40 | 12-40 | | | | |
| Mercaptans | 1000 | 1000 | | | | |
| NaOH | | | 100000 | 20000 | 100000 | 100000 |
| Na Phenolate | | | 100 | 20 | 50 | |
| Na Sulphide | | | 41000 | 8000 | 40000 | |
| Sulphide | | | | | | 40000 |
| Ammonium Hydroxide | | | | 1100 | | |

| CHEMICAL PARAMETERS | DISPOSAL WELL #2 | | | | | | |
|--------------------------|------------------|-----------|-----------|------|-------|--------|--------|
| (Concentrations in mg/L) | 1964 | 1966 | 1967 | 1969 | 1970 | 1971 | 1972 |
| H ₂ S | 2500 | 1200 | 1200 | | | | |
| pH | 12.5 | 12.0-12.8 | 12.0-12.8 | | | | |
| phenol | 85 | 100 | 100 | 75 | | | |
| HCN | | 0 | 0 | | | | |
| Alk. | | | | | | | |
| Na | 4900 | 12-40 | 12-40 | | | | |
| Mercaptans | | 1000 | 1000 | | | | |
| NaOH | | | | | 20000 | 100000 | 100000 |
| Na Phenolate | | | | | 20 | 50 | |
| Na Sulphide | | | | | 8000 | 40000 | |
| Sulphide | | | | 10 | | | 40000 |
| Ammonium Hydroxide | | | | | 1100 | | |
| Chloride | < 20 | | | | | | |

NOTE: Sulphide concentrations are reported as "sulphide" and as "H₂S" in different analyses.

TABLE A5-1 AVERAGED CONCENTRATIONS OF WASTES INJECTED INTO
 (cont'd) THE DETROIT RIVER GROUP OF FORMATIONS - ESSO (from GLAL, 1987)

| CHEMICAL PARAMETERS | DISPOSAL WELL #3 | | | | | |
|-----------------------------|------------------|------|------|------|------|------|
| (Concentrations in mg/L) | 1966 | 1967 | 1969 | 1970 | 1971 | 1972 |
| H ₂ S | 500 | 500 | | | | |
| pH | 9-10 | 9-10 | | | | |
| phenols | 500 | 500 | 100 | 100 | 100 | 100 |
| HCN | 0 | 0 | | | | |
| Alk | - | - | | | | |
| Na | | | | | | |
| Mercaptans | | | | | | |
| NaOH | | | | | | 0 |
| Na Phenolate | | | | | | |
| Na Sulphide | | | | | | |
| Sulphide | | | 30 | 30 | 30 | 0 |
| Ammonium Hydroxide | | | | | | |
| Chloride | | | | | | |

| CHEMICAL PARAMETERS | DISPOSAL WELL #4 | | | | | |
|-----------------------------|------------------|------------|-------|------|------|------|
| (Concentrations in mg/L) | 1966 | 1967 | 1969 | 1970 | 1971 | 1972 |
| H ₂ S | 2000-12000 | 2000-12000 | 50000 | 9000 | | |
| pH | 9.0-12.5 | 9.0-12.5 | | | | |
| phenol | 2000 | 2000 | 150 | 150 | 150 | 470 |
| HCN | 5 | 5 | | | | |
| Alk. | 1000 | 50000 | | | | |
| Na | 1000 | 1000 | | | | |
| Mercaptans | 1000+ | 1000+ | | | | |
| NaOH | | | | | 9000 | 3500 |
| Na Phenolate | | | | | | |
| Na Sulphide | | | | | | |
| Sulphide | | | 12000 | 100 | 100 | 100 |
| Ammonium Hydroxide | | | | | | |
| Chloride | | | | | | |

TABLE A5-1
(cont'd)

AVERAGED CONCENTRATIONS OF WASTES INJECTED INTO
THE DETROIT RIVER GROUP OF FORMATIONS - ESSO (from GLAL, 1987)

| CHEMICAL PARAMETERS (Concentrations in mg/L) | DISPOSAL WELL #5 | | | | | |
|--|------------------|------------|-------|------|------|-------|
| | 1966 | 1967 | 1969 | 1970 | 1971 | 1972 |
| H ₂ S | 2000-12000 | 2000-12000 | | | | |
| pH | 9.0-12.5 | 9.0-12.5 | | | | |
| phenols | 2000 | 2000 | 150 | 150 | 150 | |
| HCN | 5 | 5 | | | | |
| Alk | 1000 | 50000 | | | | |
| Na | 1000 | 1000 | | | | |
| Mercaptans | 1000+ | 1000+ | | | | |
| NaOH | | | 50000 | 9000 | 9000 | 50000 |
| Na Phenolate | | | | | | |
| Na Sulphide | | | | | 100 | |
| Sulphide | | | 12000 | 100 | | |
| Ammonium Hydroxide | | | | | | |
| Chloride | | | | | | |

NOTES: - Data extracted from EPC files.

- During late Sept. to mid-Dec. 1972, phenol discharges to DW4 and DW5 increased with the following 'spot checks':

Oct. 3/72 - 12,500 mg/L
 Nov. 10/72 - 28,000 mg/L
 Dec. 8/72 - 10,000 mg/L
 Dec. 14/72 - 11,300 mg/L

- In Nov. 1970 a memorandum stated the following general information regarding waste water composition:

DW1 and DW2; ammonia, spent caustic, phenolic water
 DW3; phenolic wastes
 DW4 and DW5; spent caustic, sour and phenolic water

- In June 1967, injected water was characterized as follows:

H₂S; 1200 mg/L
 pH; 9-12
 phenol; 200 mg/L
 Alkalinity; 9000 mg/L
 Chloride; 50 mg/L

TABLE A5-1 AVERAGED CONCENTRATIONS OF WASTES INJECTED INTO THE
(cont'd) DETROIT RIVER GROUP OF FORMATIONS - ESSO (from GLAL, 1987)

Analysis

| Sample ID. | DW2-A | DW2-B | DW2-C |
|-------------------------------|--------|--------|--------|
| Sampling Time, min. | 30 | 60 | 90 |
| pH | 12.0 | 11.9 | 11.9 |
| Conductivity μ mhos | 14,500 | 14,500 | 14,500 |
| Phenol, wppm | 66 | 121 | 142 |
| Total Dissolved Solids, wt% | 2.52 | 2.80 | 2.62 |
| Total Suspended Solids, wppm | 72 | 120 | 85 |
| Ammonia, wppm | 279 | 345 | 328 |
| Oil/Grease, wppm | 6.5 | 4.8 | 5.2 |
| H ₂ S, wppm | 129 | 125 | 123 |
| RSH, wppm | 9672 | 9652 | 9735 |
| Alkalinity (to pH 4.2), wppm | 6542 | 6491 | 6071 |
| Chlorides, wppm | 5986 | 5872 | 5875 |
| Antek Total Nitrogen, wppm | 326 | 325 | 316 |
| Anions, wppm | | | |
| Br ⁻ | 1510 | 1290 | 1340 |
| SO ₄ ²⁻ | 2960 | 2950 | 2970 |
| F ⁻ | - | - | - |
| NO ₂ ⁻ | - | - | - |
| NO ₃ ⁻ | - | - | - |
| PO ₄ ³⁻ | - | - | - |
| Total Carbon, wppm | 320 | 327 | 331 |
| Total Inorganic Carbon, wppm | 1 | 1 | 1 |
| Total Organic Carbon, wppm | 319 | 326 | 330 |

- Indicates non-detectable

- Sampled on 86-08-87

TABLE A5-1 AVERAGED CONCENTRATIONS OF WASTES INJECTED INTO THE
(cont'd) DETROIT RIVER GROUP OF FORMATIONS - ESSO (from GLAL, 1987)

| Sample ID. | DW2-A | DW2-B | DW2-C |
|---------------|--------|--------|--------|
| <u>Metals</u> | | | |
| Fe | 0.67 | <0.10 | 0.31 |
| Ir | 2.75 | <0.10 | 0.17 |
| V | 0.45 | 0.13 | <0.10 |
| Ti | <0.10 | <0.10 | <0.10 |
| As | <0.10 | <0.10 | <0.10 |
| Zn | 1.59 | <0.10 | <0.10 |
| Se | 0.44 | <0.10 | <0.10 |
| B | 3.58 | 3.01 | 2.67 |
| Mn | <0.10 | <0.10 | <0.10 |
| Pt | <0.10 | <0.10 | 0.50 |
| Mg | 0.22 | 0.25 | 0.37 |
| P | 1238.0 | 1604.0 | 2026.0 |
| Be | <0.10 | <0.10 | <0.10 |
| Cd | <0.10 | <0.10 | <0.10 |
| Cu | 1.58 | 1.32 | 1.12 |
| Ag | <0.10 | <0.10 | <0.10 |
| Sn | 0.61 | 0.48 | 0.48 |
| Ca | 120.8 | 230.0 | 407.4 |
| Ni | 0.10 | <0.10 | <0.10 |
| Si | 1.07 | 0.81 | 0.70 |
| Al | <0.10 | <0.10 | <0.10 |
| Cr | <0.10 | <0.10 | <0.10 |
| Ba | 0.16 | 0.12 | 0.14 |
| Mo | 0.28 | 0.15 | 0.37 |
| Pb | 0.97 | 0.44 | 0.45 |
| Co | <0.10 | <0.10 | <0.10 |
| Pd | <0.10 | <0.10 | 0.12 |
| Na | 6093.0 | 6195.0 | 6500.0 |
| K | 68.39 | 75.05 | 76.43 |

Table A5-2 Average Composition of Waste Injected into the Detroit River Group of Formations - Sun Oil Disposal Well

| Parameter (mg/L) | 1968 | 1969 | 1970 | 1972 | 1973 |
|---------------------|------|------|-------|-------|-------|
| pH | 8.3 | 9.5 | 9.2 | 9.4 | 9.5 |
| phenols | 480 | 670 | 315 | 173 | 150 |
| fluorides | 0.71 | 130 | 15 | 180 | 150 |
| chloride | 1384 | 62 | 180 | 190 | 180 |
| alkalinity | -- | 7800 | 2880 | 3312 | 6000 |
| oil | -- | 640 | 58.5 | -- | trace |
| total solids | -- | 3785 | 1869 | 1980 | 2000 |
| dissolved solids | -- | 3710 | 1836 | 1890 | 1950 |
| H ₂ S | -- | -- | 6528 | 1730 | 2000 |
| ammonia | -- | -- | 2509 | 2000 | 2000 |
| COD | -- | -- | 10200 | 10480 | 10000 |
| sulphides | 1256 | -- | -- | -- | -- |

Data from Ontario Department of Mines and Northern Affairs Annual Summary Report

Waste Description: Refinery phenolic and sour waters, neutralized acid, caustic wastes

Table A5-3 Average Composition of Waste Injected into the
 Detroit River Group of Formations
 - Shell Canada Ltd. Disposal Well #1

| Parameter (mg/L) | 1962 | 1964 | 1970 | 1971 |
|------------------------------|------|------|------|------|
| Phenols | 257 | 500 | 464 | 337 |
| Suspended Solids | -- | 13 | -- | -- |
| Sulphide as H ₂ S | -- | 2000 | -- | -- |
| Oils | 95 | -- | -- | -- |

Data from Ontario Department of Mines and Northern Affairs
 Annual Summary Report

Waste Description: Water soluble compounds leached from
 crude oil fractions and cracked products

Table A5-4 Average Composition of Waste
Injected into the Detroit
River Group of Formations
- Polymer Corp. Ltd.

| Parameter (% weight) | 1968 |
|----------------------|------|
| <hr/> | |
| sodium hydroxide | 6.0 |
| sodium hydrosulphide | 4.0 |
| sodium carbonate | 1.0 |
| phenolic compounds | 0.5 |

Data from Ontario Water Resources
Commission (1968)

Waste Description: Spent caustics

TABLE A5-5 WATER QUALITY ANALYSES FROM CAPITAL THEATRE AND ESSO FLOWING WELLS

ONTARIO WATER RESOURCES COMMISSION
TABLE OF WATER ANALYSES

AREA SURVEY

SARNA

DATE

Sept 29/72

| Source and Number | Location and Owner | Date Sampled | pH | Mineral Constituents in parts per million (ppm) | | | | | | TOC ppm | Phosphorus ppb | Sulphate | | Total Sulphate ppm | Sulphate as H ₂ S |
|-----------------------------|------------------------------|--------------|-----|---|-------------|-----------------------------|----------------|---------------|------------------------|---------|----------------|----------|--|--------------------|------------------------------|
| | | | | Calcium (Ca) | Sodium (Na) | Sulphate (SO ₄) | Magnesium (Mg) | Chloride (Cl) | Total Dissolved Solids | | | | | | |
| T22-221 | Flowing Well Capital Theatre | May 30 | 8.6 | | 1450 | 4450 | | 3960 | 9210 | 86 | | 220 | | 310 | 150 |
| T22-222 | Flowing Well Capital Theatre | May 30 | | | | | | | | | 2000 | | | 490 | 12 |
| T22-219 | Flowing Well Imperial Oil | May 30 | 9.0 | 800 | 4900 | 2000 | | 6450 | 18110 | | | 1970 | | 1800 | 1250 |
| T22-220 | Flowing Well Imperial Oil | May 30 | | | | | | | | | 5000 | | | | |
| Imperial Oil Water Recovery | Imperial Oil Water Recovery | July 28 | 7.2 | | | | | 405 | | | | 80 | | | N.L. |
| Imperial Oil Water Recovery | Imperial Oil Water Recovery | July 28 | 7.0 | | | | | 428 | | | | 60 | | | N.L. |
| Imperial Oil Water Recovery | Imperial Oil Water Recovery | July 28 | 9.4 | | | | | 9400 | | | | | | | 350 |

TABLE A5-6 WATER QUALITY ANALYSES FROM FLOWING ESSO ROCK WELLS

ANALYSES OF ROCK WELL WATER

| <u>Location</u> | <u>Marvelube Pumphouse</u> | <u>Pkg. Plant.</u> |
|------------------------|----------------------------|--------------------|
| Distance from Outbreak | 900 ft. | 780 ft. |
| Depth of Well | 139 ft. | 125 ft. |
| <u>Analysis</u> * | | |
| pH | 7.2 | 7.2 |
| H ₂ S, ppm | Nil | Nil |
| Phenols, ppb | 120 | 120 |
| Chlorides, ppm | 9.6 | 5.8 |
| NaOH, ppm | Nil | Nil |

* Samples from well bottom *July 13/72*

Reference: Letter from H.S. Wilson, Esso Chemical to Mr. D. McLean,
Department of Natural Resources, August 15, 1972

TABLE A5-6 WATER QUALITY ANALYSES FROM FLOWING ESSO ROCK WELLS
(cont'd) ANALYSES OF ROCK WELL WATER

Date - July 28/72

| Location | <u>Marvelube Pumphouse</u> | <u>Package Plant</u> |
|------------------------|----------------------------|----------------------|
| Distance from Outbreak | 900 ft. | 780 ft. |
| Depth | 139 ft. | 125 ft. |
| <u>Analysis</u> | | |
| pH | 7.2 | 7.0 |
| H ₂ S, ppm | NIL | NIL |
| Phenols, ppb | 80 | 60 |
| Chlorides, ppm | 405 | 428 |
| NaOH, ppm | NIL | NIL |

Analysis of Waste Water

| | |
|-----------------------|---------|
| pH | 9.4 |
| H ₂ S, ppm | 350 |
| Phenol, ppb | 900,000 |
| Chlorides, ppm | 9,400 |
| NaOH, ppm | 264 |

Reference: Letter from H.S. Wilson, Esso Chemical to Mr. D. McLean,
Department of Natural Resources, August 15, 1972

APPENDIX B

Report on the Analysis of
Organic Contamination in Groundwater
Samples from the Sarnia Area

(after Barringer-Magenta Ltd., 1988)

REPORT ON THE ANALYSIS OF
ORGANIC CONTAMINANTS IN GROUNDWATER
SAMPLES FROM THE SARNIA AREA

Prepared for:

The Ontario Ministry of the Environment
Detroit/St. Clair/St. Marys River Project
265 Front Street North, Suite 109
SARNIA, Ontario
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Prepared by:

Barringer Laboratories
5735 McAdam Road
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This report describes the analysis of organic contaminants in groundwater samples from the Sarnia area. Fresh water aquifer samples were analyzed from three sets of shallow wells drilled respectively in 1985, 1986 and 1987. Also, samples were analyzed which were taken at various depths from a deep borehole.

Samples were analyzed for volatile organics, base-neutral and acid extractables and organochlorine contaminants. Sample data are reported in the Appendix. Methodologies employed are described in Section 2. A discussion of the results is given in Section 3.

2. ANALYTICAL METHODOLOGY

2.1 VOLATILE ORGANIC CONTAMINANTS

This section describes the protocols for sample containers, analytical methodology, instrumentation and quality control procedures that were followed for the analysis of volatile organic contaminants. The compounds reported for this analysis along with their detection limits are given in Table 2.1.1.

2.1.1 Sample Containers

Sample bottles (60 ml amber glass - Supelco Inc., Cat. No. 2-3229), caps and teflon-lined septa (Supelco Inc., Cat. No.'s 2-3264 and 2-3242) were supplied by Barringer to the Ministry. Sufficient bottles were provided to allow for duplicate collection of each sample. The bottles were washed with detergent followed by thorough rinsing with tap water and organic-free water. The bottles were then dried at 105°C. Additional bottles cleaned in an identical manner were filled with organic-free water to serve as field blanks. These were transported to the field where sample collection took place and then returned to the laboratory intact. Samples were transported in coolers with freezer packs and stored under refrigeration until ready for analysis. All samples were analyzed within 7 days from date of receipt.

2.1.2 Analytical Procedure and Instrumentation

The methodology used closely followed U.S. E.P.A. Method 624⁽¹⁾. Two significant modifications made were the use of 25 ml rather than 5 ml sample volumes and the use of a capillary GC column rather than a packed column. This allowed for improved detection limits compared to those with the EPA method.

TABLE 2.1.1

Compounds Reported for Volatile Organics Analysis
With Corresponding Method Detection Limits

| <u>Compound</u> | <u>Detection Limit</u> <u>(ug/l)</u> | <u>Compound</u> | <u>Detection Limit</u> <u>(ug/l)</u> |
|------------------------------------|---|--|---|
| <u>(a) EPA Priority Pollutants</u> | | | |
| Acrolein | 25.0 | 1,2-Dichloroethane | 1.0 |
| Acrylonitrile | 10.0 | 1,1-Dichloroethene | 1.0 |
| Benzene | 0.5 | trans-1,2-Dichloroethene | 0.5 |
| Bromodichloromethane | 1.0 | 1,2-Dichloropropane | 1.0 |
| Bromoform | 2.0 | cis-1,3-Dichloropropene | 1.0 |
| Bromomethane | 2.0 | trans-1,3-Dichloropropene | 1.0 |
| Carbon tetrachloride | 0.5 | Ethylbenzene | 0.5 |
| Chlorobenzene | 0.5 | Methylene chloride | 1.0 |
| Chloroethane | 5.0 | 1,1,2,2-Tetrachloroethane | 2.0 |
| Chloroform | 0.5 | Tetrachloroethene | 0.5 |
| Chloromethane | 5.0 | Toluene | 0.5 |
| Dibromochloromethane | 2.0 | 1,1,1-Trichloroethane | 0.5 |
| 1,2-Dichlorobenzene | 0.5 | 1,1,2-Trichloroethane | 2.0 |
| 1,3-Dichlorobenzene | 0.5 | Trichloroethene | 0.5 |
| 1,4-Dichlorobenzene | 0.5 | Trichlorofluoromethane | 2.0 |
| Dichlorobromomethane | 1.0 | Vinyl chloride | 5.0 |
| 1,1-Dichloroethane | 0.5 | | |
| <u>(b) Other Compounds</u> | | | |
| 1-Bromo-2-chloroethane | 2.0 | Isopropylbenzene | 0.2 |
| 1,2-Dibromoethane | 2.0 | Pentachloroethane | 1.0 |
| Dibromomethane | 2.0 | Propylbenzene | 0.2 |
| Dichloroacetone | 15.0 | Styrene | 0.5 |
| cis-1,2 Dichloroethane | 0.5 | 1,2,4-Trichlorobenzene | 1.0 |
| 1,2-Diethylbenzene | 0.2 | 1,1,2-Trichloro-1,2,2-tricfluoroethane | 2.0 |
| 1,3-Diethylbenzene | 0.2 | 1,2,3-Trimethylbenzene | 0.2 |
| 1,4-Diethylbenzene | 0.2 | 1,2,4-Trimethylbenzene | 0.2 |
| 1-Ethyl-2-Methylbenzene | 0.2 | 1,3,5-Trimethylbenzene | 0.2 |
| 1-Ethyl-3-Methylbenzene | 0.2 | m-Xylene | 0.5 |
| 1-Ethyl-4-Methylbenzene | 0.2 | o-Xylene | 0.5 |
| Hexachloro-1,3-butadiene | 0.5 | p-Xylene | 0.5 |
| Hexachloroethane | 1.0 | | |

Sample aliquots were taken in a gas tight syringe (Hamilton No. 1025 TLL), spiked with internal/surrogate standard solution (Table 2.12) and introduced to the sparge vessel of the purge and trap device. For the first sampling round a CDS 320 Purge and Trap Concentrator was used with conditions described in Table 2.13. For the remaining three sampling rounds a Tekmar Model LSC-2 Purge & Trap Concentrator combined with a Tekmar Model ALS Autosampler were used. Conditions are provided in Table 2.14. After purging the sample was desorbed from the trap via a heated interface line to a Perkin Elmer Sigma 3B Gas Chromatograph which was coupled via a direct capillary transfer line to the source of a Finnigan Model 1020B Mass Spectrometer. Gas Chromatographic conditions are provided in Table 2.15. Mass spectrometer operating conditions are provided in Table 2.16.

2.1.3 Standard Solutions

Standard cocktail solutions for the U.S. E.P.A. volatile Priority Pollutant Compounds were obtained from Supelco Inc. (Purgeable A - Cat. No. 4-8851, Purgeable B - Cat. No. 4-8852, Purgeable C - Cat. No. 4-8853). For the remaining compounds, individual stock solutions were prepared from the pure compounds. These individual solutions were used to prepare standard cocktails of non-priority pollutant compounds. The final working standard solutions for calibration were prepared fresh each week from the Priority Pollutant and non-Priority Pollutant cocktail solutions. All standard solutions were made in methanol and stored in teflon-lined screw cap vials of appropriate volume to minimize headspace. Solutions were kept in the laboratory freezer when not in use. Standard solutions for QC spiking purposes were prepared in an identical manner, but were made using independently prepared or purchased stock solutions.

TABLE 2.1.2Internal (I.S.) and Surrogate (S.S.) Standards
for Volatiles Analysis

Bromochloromethane (I.S.)

1-Chloro-2-bromopropane (S.S.)

1,4-Dichlorobutane (I.S. & S.S.)

4-Bromofluorobenzene (S.S.)

TABLE 2.1.3Purge and Trap Conditions (CDS 320 Concentrator)

| | | | |
|--------------------|---|---|---------------------|
| PURGING MODE: | Purge Vessel | : | 30 ml capacity |
| | Sample Volume | : | 25.0 ml |
| | Purge Gas | : | Helium @ 40 ml/min. |
| | Purge Time | : | 8 min. |
| | Purge Temperature | : | 28±2°C |
| DESORB MODE: | Desorb Gas | : | Helium @ 2 ml/min |
| | Desorb Time | : | 10.0 |
| | Desorb Temperature | : | 180°C |
| | Transfer Line Temp. | : | 230°C |
| TRAP CONSTRUCTION: | 25 cm stainless steel, 1/8" OD | | |
| TRAP PACKING: | 1 cm 3% SP-2100 on 60/80 Chromosorb WAW | | |
| | 15 cm Tenax TA, 60/80 mesh | | |
| | 8 cm silica Gel Grade 15, 35/60 mesh | | |
| TRAP BAKEOUT: | Temperature | : | 225°C |
| | Time | : | 15 min. |

TABLE 2.1.4Purge and Trap Conditions (Tekmar)

INSTRUMENTATION: Tekmar Model LSC-2 Purge and Trap Sample
Concentrator
Tekmar Model ALS Autosampler

PURGING MODE: Purge Vessel : 30 ml capacity
Sample Volume : 25.0 ml
Purge Gas : Helium @ 40 ml/min.
Wet Purge Time : 8 min.
Dry Purge Time : 6 min.
Purge Temperature : $28 \pm 2^{\circ}\text{C}$

DESORB MODE: Desorb Gas : Helium @ 2 ml/min
Desorb Time : 10.0
Desorb Temperature : 220°C
Transfer Line Temp. : Approx. 100°C

TRAP CONSTRUCTION: 25 cm stainless steel, 1/8" OD

TRAP PACKING: 7.5 cm Carboxpack B, 60/80 mesh
1.3 cm Carboxeive S-III, 60/80 mesh
(obtained from Supelco Inc. Cat. No. 2-0321)

TRAP BAKEOUT: Temperature 280°C
Time 15 min.

TABLE 2.1.5Gas Chromatographic Conditions

(a) First Sampling Round

INSTRUMENTATION: Perkin-Elmer Sigma 3B

ANALYTICAL COLUMNS: VOCOL Wide Bore Capillary
60 m X 0.75 mm ID, 1.0 μ m Film
(Supelco Inc., Catalog #2-3731)

CARRIER GAS: Helium, 2 ml/min.

COLUMN OVEN: Initial Temperature : 50° C
Initial Time : 16 min
Program Rate : 4° C/min.
Final Temperature : 186° C

INJECTOR TEMPERATURE: 230° C

PURGE/TRAP TRANSFER
LINE TEMPERATURE: 230° C

(b) Second, Third, and Fourth Sampling Rounds

INSTRUMENTATION: Perkin-Elmer Sigma 3B

ANALYTICAL COLUMNS: J & W DB-624 Capillary
30 m X 0.32 mm ID, 1.8 μ m Film
(J & W Catalog #2-3731)

CARRIER GAS: Helium, 2 ml/min. @ 8 psi head pressure

COLUMN OVEN: Initial Temperature : 40° C
Initial Time : 15 min
Program Rate : 4° C/min.
Final Temperature : 160° C

INJECTOR TEMPERATURE: 200° C

PURGE/TRAP TRANSFER
LINE TEMPERATURE: Approx. 100° C

TABLE 2.1.6Mass Spectrometer Operating Conditions

| | |
|-------------------------------|---|
| INSTRUMENTATION: | Finnigan Model OWA 1020B Mass Spectrometer 1050 Super Incos/OWA Software/Hardware Upgrade 70 Mbyte Winchester Disk Drive 20 Mbyte Streaming Tape Back-up System |
| MASS RANGE: | 45-300 AMU |
| SCAN RATE: | 2.0 sec/scan (7.84 ms/AMU) |
| MS TRANSFER LINE TEMPERATURE: | 220°C |
| SOURCE TUNING: | Using Perfluorotributylamine (PFTBA) as per Finnigan's specifications. 4-bromofluorobenzene (BFB) spiked into all samples. Mass spectrum of BPB compared with mass abundance ratio criteria of U.S. E.P.A. Method 624 to confirm tuning. |

The internal/surrogate standard solution which was spiked into every sample was prepared from a stock solution obtained from Supelco (Cat. No. 4-8864) and from a solution of 4-bromofluorobenzene prepared in the laboratory. This solution was prepared fresh weekly in a 10 ml volumetric flask using organic-free water as solvent. The contents were immediately transferred to five 2 ml teflon-lined screw cap vials and stored in the refrigerator when not in use. A fresh vial was taken for each working day and discarded at the end of the day.

2.1.4 Data Processing

Spectra for each of the target compounds were obtained by running standards. The spectra were reduced to the 3 to 10 most significant masses and from these reduced spectra a reverse search library was created.

Data files were processed using Finnigan Super Incos Data System Autoquan Software. The reverse search routine looks for each target compound within a specified retention time window. The reverse library spectrum of the target compound is compared to the mass spectra of any peaks found within the retention time window of the sample file. For each peak, a FIT calculation is made which measures the degree to which the library spectrum is included in the unknown spectrum. A FIT of 1000 indicates that all library masses occur as masses in the unknown; and for those masses in common, all the intensities are exactly proportional. A FIT of 0 indicates that none of the masses in the library spectrum occur in the sample spectrum. A FIT threshold of 850 was specified for all of the target compounds. If no peaks are found within the retention time window which exceed the FIT threshold, the target compound is denoted as "NOT FOUND".

If a peak is found which meets the above criteria, an amount is calculated using a single quantitation mass. The amount is calculated by:

$$\text{AMOUNT}_X = \frac{\text{AREA}_X \times \text{AMOUNT}_{IS}}{\text{AREA}_{IS} \times \text{RESPONSE FACTOR}_X}$$

where AREA_X and AREA_{IS} are the intensities of the quantitation mass for the target compound and internal standard respectively, AMOUNT_{IS} is the amount of internal standard spiked into the sample, and RESPONSE FACTOR_X is the response factor for the compound relative to the internal standard determined from the daily standard run.

All computer reports were checked and any questionable assignments were manually confirmed or corrected if necessary. If the concentration for a particular compound in a sample was large enough to exceed the linear quantitation range, a repeat injection of the sample was made at an appropriate dilution. The amount for the compound found for the diluted sample multiplied by the appropriate dilution factor would then be reported.

Computerized forward library searches were performed on all samples using an NBS Mass Spectral Data Base of 42,000 compounds. All peaks in the chromatogram due to non-target compounds whose areas represented greater than 5 ug/l compared to the internal standard were searched. The names and mass spectra of the 3 best matches based on fit criteria were printed. Amounts were calculated based on an area comparison with the internal standard. Results of the library searches have already been submitted to the Ministry.

2.1.5 Quality Control

An initial multipoint calibration was performed by analyzing standard solutions containing the target compounds at 5 different concentrations throughout the working range of the analysis. Response factors relative to the internal standard were calculated for each compound at each concentration. Response factors were found to be constant within EPA guidelines over the working range for all compounds (i.e. less than 35% Relative Standard Deviation from the mean).

At the beginning of each working day the instrument was tuned and then a reagent blank consisting of 25 ml organic-free water spiked with internal/surrogate standard solution was analyzed. Checks were made for background contamination, relative and absolute responses of internal/surrogate standards, and mass ratios of 4-bromofluorobenzene using EPA mass abundance criteria. If the results were unacceptable, appropriate adjustments were made and the reagent blank analysis was repeated.

Once an acceptable blank was obtained, a daily calibration standard consisting of 25 ml organic free water spiked with internal/surrogate standard solution and target compound calibration standard solution was analyzed. The response factor for each compound was calculated and compared to the mean value obtained from the multipoint calibration. U.S. E.P.A. Method 624 provides individual acceptance criteria for each compound. Since the E.P.A. method calls for the use of a packed column and higher standard concentrations than used here, the E.P.A. criteria do not apply specifically to our conditions. Consequently we adopted an acceptability criterion of $\pm 40\%$ deviation between the multipoint calibration mean response factor and the daily standard response factor for the 4 volatile gases (chloromethane, chloroethane, vinyl chloride,

and bromomethane) and an acceptability criterion of $\pm 30\%$ for all other compounds. The compounds in the daily standards usually met these criteria which are generally more stringent than those given in the E.P.A. method. If successive analyses of daily calibration standards showed a definite trend of compounds falling outside the QC limits, then the multipoint calibration procedure was repeated using a freshly prepared set of standards. If the daily standard was found to be acceptable, then the response factors for that day were stored in the calibration table and used for quantitation of subsequent sample runs.

Each sample was spiked with internal/surrogate standard solution. Percentage recoveries of surrogate standards are comparisons of surrogate responses in the sample to those in the daily calibration standard and as such provide a measure of precision. Large deviations from 100% recovery; for a particular sample may indicate matrix effects or a problem with the analysis. Surrogate standard recovery data are included with the sample data in the appendix.

Duplicate analyses were performed on approximately 10% of the samples. These are designated as "QC-REPEAT" in the appendix. Blind duplicates for certain samples were provided by the Ministry and results are included under the designation DUPLICATE. Results of additional blind quality assurance/quality control samples submitted by the Ministry have been designated as QA/QC. Results for field blanks are also included with the data.

Approximately 5% of samples were spiked with the same target compound calibration mix used for the daily standard. Spike recovery data from these spiked samples provide another indicator of precision and indicate whether matrix effects are

important. As an additional QC measure a similar number of spiked reagent blanks were analyzed. These consisted of 25 ml organic-free water spiked with internal/surrogate standard mix and an independently prepared QC target compound calibration mix. These QC spikes were used to confirm the accuracy of the daily calibration standards. Target compound spike recovery data are provided in the Appendix following the sample data.

2.2 BASE-NEUTRAL AND ACID EXTRACTABLE ORGANIC CONTAMINANTS

This section describes sampling containers, analytical methodology, instrumentation, and quality control procedures that were followed for the analysis of base-neutral and acid extractable organics. The base-neutral extractable compounds reported for this analysis are given in Table 2.2.1. The acid extractable compounds reported are given in Table 2.2.2.

2.2.1 Sample Containers

Amber glass sample bottles (Dominion Glass, 1 liter Metric Round) and caps with 28 mm diameter teflon liners (Supelco Inc.) were supplied to the Ministry for sampling. The bottles were solvent rinsed with dichloromethane (Caledon, Distilled in Glass) and dried in an oven at 105°C. Additional bottles cleaned in a similar manner were filled with organic-free water to serve as field blanks. Samples were transported in coolers with freezer packs and stored under refrigeration until ready for extraction. All samples were extracted within 7 days of receipt.

TABLE 2.2.1

Base-Neutral Extractable Compounds
Reported with the Corresponding Method Detection Limits

| <u>Compound</u> | <u>M.D.L. (ug/l)</u> | <u>Compound</u> | <u>M.D.L. (ug/l)</u> |
|-------------------------------------|----------------------|---------------------------|----------------------|
| <u>(a) EPA Priority Pollutants</u> | | | |
| Acenaphthene | 0.5 | 1,3-Dichlorobenzene | 0.5 |
| Acenaphthylene | 0.5 | 1,4-Dichlorobenzene | 0.5 |
| Anthracene | 0.5 | 3,3'-Dichlorobenzidine | 10.0 |
| Benzo(a)anthracene | 2.0 | Diethylphthalate | 0.5 |
| Benzo(b)fluoranthene | 3.0 | Dimethylphthalate | 0.5 |
| Benzo(k)fluoranthene | 3.0 | 2,4-Dinitrotoluene | 0.5 |
| Benzo(a)pyrene | 3.0 | 2,6-Dinitrotoluene | 1.0 |
| Benzo(ghi)perylene | 5.0 | Di-n-octylphthalate | 2.0 |
| Benzyl butyl phthalate | 2.0 | Fluoranthene | 0.5 |
| Bis(2-chloroethyl)ether | 0.5 | Fluorene | 0.5 |
| Bis(2-chloroethoxy)methane | 2.0 | Hexachlorobenzene | 1.0 |
| Bis(2-ethylhexyl)phthalate | 3.0 | Hexachlorobutadiene | 0.5 |
| Bis(2-chloroisopropyl)ether | 2.0 | Hexachloroethane | 0.5 |
| 2-Bromophenyl phenyl ether | 0.5 | Indeno(1,2,3-cd)pyrene | 3.0 |
| 2-Chloronaphthalene | 0.5 | Isophorone | 0.5 |
| 2-Chlorophenyl phenyl ether | 1.0 | Naphthalene | 0.5 |
| Benzofluoranthene | 1.0 | Nitrobenzene | 0.5 |
| Benzofluoranthene | 3.0 | N-Nitrosodi-n-propylamine | 5.0 |
| Bis(2-ethylhexyl)phthalate | 0.5 | Phenanthrene | 0.5 |
| 1,2-Dichlorobenzene | 0.5 | Pyrene | 0.5 |
| | | 1,2,4-Trichlorobenzene | 0.5 |
| <u>(b) Other Compounds Reported</u> | | | |
| Hexachlorocyclopentadiene | 10 | 1-Methylnaphthalene | 0.5 |
| Benzenzidine | 15.0 | 2-Methylnaphthalene | 0.5 |
| | | N-Nitrosodiphenylamine | 1.0 |

TABLE 2.2.2

Acid Extractable Compounds
Reported and the Corresponding Method Detection Limits

| <u>Compound</u> | <u>M.D.L. (ug/l)</u> | <u>Compound</u> | <u>M.D.L. (ug/l)</u> |
|------------------------------------|----------------------|-----------------------|----------------------|
| <u>(a) EPA Priority Pollutants</u> | | | |
| 4-Chloro-3-methylphenol | 1.0 | 2-Nitrophenol | 2.0 |
| 2-Chlorophenol | 1.0 | 4-Nitrophenol | 5.0 |
| 2,4-Dichlorophenol | 1.0 | Pentachlorophenol | 3.0 |
| 2,4-Dimethylphenol | 1.0 | Phenol | 0.5 |
| 2,4-Dinitrophenol | 10.0 | 2,4,6-Trichlorophenol | 2.0 |
| 2-Methyl-4,6-dinitrophenol | 10.0 | | |

2.2.2 Glassware Cleaning

All non-disposable glassware used for the analysis was cleaned by soaking for one hour in an aqueous solution of RBS-35 alkaline cleaning solution (Chromatographic Specialties Ltd., Cat. No. P27952), scrubbing with a brush, and rinsing thoroughly with tap water. This was followed by rinsing with distilled water, then with acetone (Caledon, Distilled in Glass) and oven drying at 130°C. After washing was completed, glassware was stored in a clean, dust-free environment.

2.2.3 Analytical Procedures

The methodology used was similar to U.S. E.P.A. Method 625⁽²⁾. Modifications are described below:

Sample volume was adjusted to 800 ml by decanting excess. If less than 800 ml volume was provided, the volume was noted and appropriate corrections were made to the final results. 1 ml of surrogate standard spiking solution (Table 2.2.3) was added to each sample before extraction.

The pH was adjusted to greater than 11 with 6 N sodium hydroxide. Three extractions were performed with 60 ml aliquots of dichloromethane (Caledon, Distilled in Glass). The extracts were filtered through predried and prerinsed sodium sulfate and combined in a round bottom flask. The pH of the sample was then adjusted to less than 2 with 6N sulfuric acid and three more extractions were carried out with 60 ml portions of dichloromethane. For the first round of shallow well samples, base-neutral and acid fractions were concentrated and analyzed separately. For the last three rounds of shallow well samples and for all deep well samples, the base-neutral and acid fractions were combined before concentration and analyzed in a single fraction.

TABLE 2.2.3Surrogate Standards for Base-Neutral and
Acid Extractable Analyses

Base-Neutral Extractables:

Nitrobenzene-d₅
2-Fluorobiphenyl
Terphenyl-d₁₄

Acid Extractables:

Trifluoro-m-cresol
2,4,6-Tribromophenol

For the first sample round extractions were carried out directly in the sampling bottles. After each addition of dichloromethane the sample bottles were placed in a rotary tumbler assembly (capacity 12 bottles) and tumbled at a rate of 10 rpm for 30 minutes. Dichloromethane was removed by siphoning using a 100 ml pipet under suction.

For the last three sample rounds, a modification was made to the extraction procedure which eliminated the siphoning step by pipet which was slow and cumbersome. Specially constructed extraction vessels were made from 1 litre Kimax cylindrical separatory funnels with teflon plug stopcocks (Canlab Cat. No. F7830-1L). The ground glass joints at the top were removed by a glassblower and replaced with pieces of threaded glass (Pegasus Corp.) on which screw caps with teflon liners could be placed. Samples were poured into the extraction vessels and extraction was carried out using a rotary tumbler as described above. The top threaded cap was removed to add the sample and reagents and replaced during tumbling. The dichloromethane layer was drained by opening the bottom stopcock.

Concentration of the sample extracts to a volume of 5 to 10 ml was performed using a rotary evaporator. Extracts were then transferred to 15 ml glass graduated centrifuge tubes and concentrated to a final volume of 2 ml by impinging a stream of dried purified nitrogen onto the solvent surface with gentle heating on a water bath (35°C). The concentrated extracts were capped and refrigerated until ready for analysis. Prior to analysis the centrifuge tubes were removed from refrigeration, allowed to come to room temperature and topped up to 2.0 ml if any evaporation had occurred. All extracts were spiked with internal standard solution (Table 2.2.4) prior to GC/MS analysis.

TABLE 2.2.4

Internal Standards (I.S.) Compounds
for Base-Neutral and
Acid Extractable Analyses

Base-Neutral Extractables:

Anthracene-d₁₀ (I.S. for Base-neutrals and acids)

Benzo(a)anthracene-d₁₂ (I.S. for Base-neutrals)

Decafluorotriphenylphosphine (evaluation compound
for E.P.A. mass abundance ratio criteria)

2.2.4 Standard Solutions

The surrogate standard solution (Table 2.2.3) which was spiked into all samples before extraction was prepared in acetone. The internal standard solution (Table 2.2.4) which was spiked into all final extracts before analysis was prepared in dichloromethane. For the U.S. E.P.A. Priority Pollutant base-neutral and acid extractable compounds, standard cocktail solutions were obtained from Supelco Inc. (Cat. No. 4-8900, 4-8901, 4-8904, 4-8905, 4-8906). Individual stock solutions were prepared for 1-methylnaphthalene and 2-methylnaphthalene from the pure compounds. Daily calibration standards were prepared in dichloromethane using appropriate amounts of the internal standard solution, surrogate standard solution, Priority Pollutant cocktails and methylnaphthalene stocks. The target compound spiking mix which was spiked into reagent blanks and samples for QC purposes was made in acetone using independently prepared Priority Pollutant cocktails and methylnaphthalene stocks.

2.2.5 Instrumentation and Data Processing

Analysis was performed using a Varian 3400 Gas Chromatograph interfaced to a Finnigan INCOS 50 Mass Spectrometer. Gas chromatograph operating conditions are given in Table 2.2.5. Operating conditions for the mass spectrometer are given in Table 2.2.6. Data processing was performed in the same manner as for volatile organics as described in Section 2.1.4.

2.2.6 Quality Control

An initial multipoint calibration was performed by analyzing standard solutions containing the target compounds at several different concentrations throughout the working range of the analysis. Response factors were found to be constant over the range of calibration within E.P.A guidelines (less than 35%

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TABLE 2.2.5Gas Chromatography Operating Conditions for
Base-Neutral and Acid Extractable Analyses

INSTRUMENTATION: Varian 3400 Gas Chromatograph

ANALYTICAL COLUMN: J & W DB-5
30 m X 0.25 mm ID, 0.25um Film
(J & W Cat. No. 122-5032)

CARRIER GAS: Helium, 2.0 ml/min. @ 10 psi head pressure

COLUMN OVEN: Initial Temperature : 50° C
Initial Time : 0 min.
Program Rate : 5 C°/min.
Final Temperature : 300° C
Hold Time : 8 min.

INJECTOR CONDITIONS: Split/Splitless
Split Vent Closed for 0.5 min.
280° C

INJECTION VOLUME: 2 ul

TABLE 2.2.6Mass Spectrometer Operating Conditions for
Base-Neutral and Acid Extractable Analyses

| | |
|-------------------------------|---|
| INSTRUMENTATION: | Finnigan Model Incos 50 Mass Spectrometer Data General Micro Eclipse Data Systemrdware Upgrade Super Incos Software Package |
| MASS RANGE: | 45-350 AMU |
| SCAN RATE: | 1.0 sec/scan (3.73 ms/AMU) |
| MS TRANSFER LINE TEMPERATURE: | 290°C |
| SOURCE TUNING: | Using Perfluorotributylamine (PFTBA) as per Finnigan's specifications. All samples spiked with Decafluorotriphenylphosphine (DFTPP). Mass sepctrum of DFTPP compared with mass abundance ratio criteria of U.S. E.P.A. Method 625 to confirm tuning. |

Relative Standard Deviation from the mean) with the exception of the later-eluting polyaromatic hydrocarbons and late-eluting phenols. Calibration curves were set up for these compounds rather than using the average of the response factors over the calibration range.

Following the analysis of the first batch of 8 samples, some modifications were made to the analysis as described below and another multipoint calibration was performed. A second internal standard (benzo(a)anthracene-d12) was introduced for use in quantitation of the later eluting base-neutral compounds (benzyl butyl phthalate to benzo(ghi)perylene). A second surrogate standard (2,4,6-tribromophenol) was added for the acid extractable compounds. Also a routine of daily septum changes and weekly replacement and silanization of the glass injection port liners for the gas chromatograph was implemented. Following these modifications, the precision of response factors for the later eluting PAH's and phenols improved such that the E.P.A. criterion of less than 35% Relative Standard Deviation was attained for all target compounds over the calibration range.

Each day following tuning of the mass spectroemeter a calibration standard with the equivalent of 50 ug/l of each target compound, surrogate standard, and internal standard was run. Tuning was checked by comparing the spectrum of decafluorotriphenylphosphine which was included in the mixture with the E.P.A. mass abundance criteria. Response factors for each target compound in the daily standard were calculated and compared to the multipoint calibration values. Deviations between response factors of the daily standard from the multipoint response values were generally less than $\pm 30\%$. Multipoint calibrations with fresh calibration standards were repeated periodically throughout the program when evidence of response factor drift became apparent.

Extractions were generally carried out in batches of 12 consisting of 8 samples, 1 reagent blank, 1 duplicate sample, 1 spiked reagent blank, and 1 spiked duplicate sample. When insufficient samples were submitted within a one week period to make a complete batch, a partial batch was extracted containing a reagent blank and at least one QC spike. A minimum of 10% of the samples submitted were run in duplicate.

All samples were spiked with surrogate standard solution. Surrogate standard recovery data are included with the sample data in the appendix. Results for field blanks are given. Results for blind duplicates and QA/QC samples submitted by the Ministry are also included and are designated as "QC-REPEAT" and "QA/QC". Target compound spike recovery data are provided in the appendix following the sample data.

2.3 ORGANOCHLORINE CONTAMINANTS

This section describes sampling containers analytical methodology, instrumentation and quality control procedures that were followed for the analysis of organochlorine contaminants. The compounds reported for this analysis are given in Table 2.3.1.

2.3.1 Sample Containers and Glassware Cleaning

The sample containers and protocol for their cleaning and field blank preparation was identical to that for base-neutral and acid extractables as described in Section 2.2.1. Glassware cleaning was carried out as described in Section 2.2.2. All samples were extracted within 7 days of receipt.

TABLE 2.3.1

Organochlorine Compounds Reported
with Method Detection Limits

| <u>Compound</u> | <u>M.D.L. (ug/l)</u> |
|-------------------|----------------------|
| Total PCB's | 0.01 |
| Hexachlorobenzene | 0.001 |
| Octachlorostyrene | 0.001 |
| Heptachlor | 0.0005 |
| pp'-DDE | 0.0005 |
| Mirex | 0.001 |
| Aldrin | 0.0005 |

2.3.2 Standard Solutions

Aroclors 1016, 1221, 1232, 1242, 1248, 1254 and 1260 were obtained in a kit as individual solutions (Supelco Inc., Cat. No. 4-8825). Working standards for calibration were prepared in isooctane for each of the individual aroclors.

For the other organochlorine compounds stock solutions were prepared from the pure compounds. A working standard for calibration was prepared in isooctane containing a cocktail of each of the organochlorine compounds.

For spiking of samples, a solution of Aroclor 1254 was prepared in methanol. A spiking cocktail in methanol was also prepared for the other organochlorine compounds.

2.3.3 Analytical Procedure

The analytical procedure was a modification of U.S. E.P.A. Method 608⁽³⁾. Sample volume was adjusted to 800 ml by decanting any excess. If less than 800 ml volume was provided, the volume was noted and appropriate corrections were made to the final results. Three extractions were performed with 60 ml aliquots of dichloromethane (Caledon, Distilled in Glass). The extracts were filtered through predried and prerinsed sodium sulfate and combined in a round bottom flask.

For the first sampling round, extractions were carried out directly in the sampling bottles using a rotary tumbler as described in Section 2.2.3. For the last three sampling rounds extractions were performed using extraction vessels and a rotary tumbler as described in Section 2.2.3.

Concentration of the sample extracts to a volume of 2 to 5 ml was performed using a rotary evaporator. This was followed by exchange into hexane (Caledon, Distilled in Glass). Three successive 10 ml aliquots of hexane were added with concentration down to about 2 ml after each addition. The hexane extract was then transferred to the top of a glass column (6 mm I.D.x 280 mm with teflon stopcock and glass joint at the top fitted with a 100 ml reservoir) and packed with preactivated, prerinsed Fluorisil PR (60/100 mesh, Supelco Cat. No. 2-0280). The column was eluted with 30 ml of hexane and the resulting fraction was concentrated and exchanged into isooctane using a rotary evaporator as described above for the initial exchange into hexane. The final extract was transferred to a graduated centrifuge tube, made up to 5.0 ml with isooctane and stored in the refrigerator until ready for analysis.

2.3.4 Instrumentation and Data Processing

Analysis was performed using a Varian 3500 Gas Chromatograph equipped with dual capillary analytical columns and dual electron capture detectors. The use of two capillary columns of different polarity allowed for greater sensitivity and higher confidence in identification than available using the single packed column called for in U.S. E.P.A. Method 608. The operating conditions for the gas chromatograph are given in Table 2.3.2. The two detector signals were output to dual channels of a Spectra-Physics Model SP4270 Computing Integrator. Separate calibration files were stored on both integrator channels for the organochlorine compound mix and for each Aroclor standard.

TABLE 2.3.2

Gas Chromatographic Operating Conditions
for Organochlorine Contaminants Analysis

| | | | |
|------------------------|---|---|-------------|
| INSTRUMENTATION: | Varian 3500 Dedicated Capillary Gas Chromatograph Equipped with Dual Electron Capture Detectors | | |
| CARRIER GAS: | Helium, 2 ml/min. | | |
| MAKE-UP GAS: | Nitrogen, 22 ml/min. | | |
| COLUMN OVEN: | Initial Temperature | : | 80° C |
| | Initial Time | : | 0 min. |
| | Program #1: | | |
| | Rate | : | 30 C°/min. |
| | Final Temperature | : | 160°C |
| | Hold Time | : | 0 min. |
| | Program #2: | | |
| | Rate | : | 3.0 C°/min. |
| | Final Temperature | : | 250°C |
| | Hold Time | : | 0 min. |
| INJECTOR CONDITIONS: | Split/Splitless | | |
| | Split Vent Closed 0.5 min, open thereafter | | |
| | 250°C | | |
| INJECTION VOLUME: | 2.0 ul | | |
| DETECTOR TEMPERATURES: | 300°C (Both) | | |
| ANALYTICAL COLUMNS A: | J & W DB-5 | | |
| | 30 m x 0.25 mm I.D., 0.25 um Film | | |
| | (J & W Cat. #122-5032) | | |
| | (J & W Cat. #DB-1701) | | |
| B: | 30 m x 0.25 mm I.D., 0.25 um Film | | |
| | (J & W Cat. #122-0732) | | |

The calibration files for the organochlorine compound mix contained entries for compound name, retention time, and response factor. For each sample analysis, a chromatogram and quantitation report was printed for each channel. If a peak did not occur within a specified retention time window (± 0.01 min.) for a compound on both channels, then the compound was reported as not detected. If a peak was found on both channels within the specified retention time window and the calculated amounts agreed to within 20%, the average of the two amounts was reported. If peaks were found on both channels and the calculated amounts differed by more than 20%, the assumption was made that the higher value contained a contribution from a coeluting impurity and the lower values was reported with the result flagged.

The calibration files for each Aroclor mix contained retention times and response factors for 5 major peaks characteristic of that Aroclor. In order for an Aroclor to be confirmed, all five peaks had to be found on each channel and the relative peak areas on each channel had to correspond to those of the calibration standard.

2.3.5 Quality Control

An initial three point calibration was performed for the organochlorine compound mix and also for Aroclor 1254. The E.P.A. acceptance criterion of less than 10% relative standard deviation for the response factors throughout the calibration range was met for all compounds. Single point calibrations were performed for the other six Aroclor mixtures which were kept on file and updated periodically.

Each day a blank injection of solvent was made to ensure that the chromatographic system was free from interferences. Next an organochlorine mix calibration standard was analyzed and response factors compared to that of the multipoint calibration. The same was done for an Aroclor 1254 calibration standard. Response factors for the compounds generally fell within E.P.A. Method 608 acceptance criterion of $\pm 15\%$ difference. Multipoint calibrations were repeated periodically when detector sensitivity drifts were noted. Retention times and response factors of the daily standards were placed in the calibration files of the integrator and used for the analysis of subsequent samples.

Extractions were generally carried out in batches of 12 consisting of 8 samples, 1 reagent blank, 1 duplicate sample, 1 spiked reagent blank and 1 spiked duplicate sample. Fifty percent of spikes were performed with the organochlorine compound spiking cocktail and 50% were spiked with Aroclor 1254.

Analytical results are given in the Appendix including results for duplicates, field blanks, and blind duplicates and QA/QC samples submitted by the Ministry. Spike recovery data are presented following the sample data.

3. DISCUSSION OF RESULTS

3.1 VOLATILE ORGANIC CONTAMINANTS

Results for the first batch of volatile samples submitted (4-87, 6-87, 8-87, 87-01, P8-86BL, MD-1 and MD MLS-2) and the field blank showed elevated amounts of chloroform and dichloromethane. With the exception of a trace of dichloromethane, these compounds did not appear in our reagent blanks or in a house blank prepared at the same time as the field blank. An investigation showed that the problem was due to contaminated freezer packs placed in the coolers in which the sample bottles were transported. The freezer packs were discarded and this problem did not recur with future samples.

Traces of dichloromethane generally less than 1 ug/l though occasionally higher were found in most blanks and samples. Care was taken to keep volatile solvents out of the mass spectrometer room during analysis of volatile organics. However, it was sometimes necessary to perform analyses of base-neutrals and acid extractables at the same time as volatile analyses. When base-neutral and acid extractable analyses were taking place, the dichloromethane extracts were stored in capped centrifuge tubes in a fume hood. Syringe aliquots for injection were taken inside the fume hood. Our extraction laboratory was located in a different part of the building from the mass spectrometer room. Although all extractions using dichloromethane were carried out in fume hoods in the extraction laboratory it is possible that traces of dichloromethane may have circulated via the building ventilation system to the mass spectrometer room.

Trichlorofluoromethane was found in most samples typically between 0.2 to 2 ug/l. It was also found in the field blanks at higher levels varying from about 4 to 40 ug/l. However, it was not found to be present in our reagent blanks or house blanks. The source of this contamination is unclear. It appears to have permeated through the teflon-backed silicone septa into the

sampling bottles during shipment or sampling. Since field blanks were sitting around longer than samples, they appear to have accumulated greater amounts of this compound.

The fresh water aquifer shallow well samples were found to be free of significant volatile organic contamination. Significant amounts of volatile aromatic hydrocarbons were present in the deep borehole samples. The forward library search results revealed the presence of significant quantities of organosulfur compounds as well. Due to the large amount of benzene and toluene present in these samples, dilution factors of 25 to 100 were required. The samples could not be run undiluted without causing severe contamination of the purge and trap system and the mass spectrometer ion source.

3.2 BASE-NEUTRAL AND ACID EXTRACTABLE CONTAMINANTS

The base-neutral extractable results show the presence of some phthalate ester compounds, particularly di-n-butyl phthalate and bis(2-ethylhexyl) phthalate, in reagent blanks, field blanks and samples. It appears that they are artifacts from sampling and analytical procedures. We attempted to minimize this problem by scrupulous cleaning of glassware and oven baking of the sodium sulfate drying reagent in a muffle furnace at 450°C. Midway through the program we switched from using cellulose filter paper (Whatman No. 42) to glass microfibre filters (Whatman Grade 934-AH). The glass microfibre filters were baked at 450°C. and solvent rinsed before use.

The compound benzidine showed very poor extraction recovery. Although it was observed in our calibration standards, little or none of this compound was recovered after extraction.

The fresh water aquifer shallow well samples did not contain significant amounts of base-neutral or acid extractable compounds. Analysis of the deep borehole samples was complicated by the presence of high amounts of sulfurous

material. On adjusting the pH to greater than 11 prior to extraction yellow precipitate came out of solution which had the appearance of elemental sulfur. Mass spectral forward library searches of the sample chromatograms indicated the presence of elemental sulfur and organosulfur compounds in the sample extracts. The acid extractable compound phenol was found in high concentration in the deep borehole samples maximizing at around 40,000 ug/l at a depth of 192 meters. 2,4-dimethylphenol also maximized at this depth at a concentration of about 1,000 ug/l. These values probably underestimate the true levels since extraction recoveries in spiked samples for phenol averaged about 40% and for 2,4-dimethylphenol averaged about 30%. Other alkylphenols were confirmed to be present from the forward library searches, but no chlorophenols or nitrophenols were discovered. In the base-neutral fraction, naphthalene was found in concentrations up to about 500 ug/l and methyl naphthalenes up to about 150 ug/l also maximizing at 192 meters.

3.3 ORGANOCHLORINE CONTAMINANTS

No significant amounts of the target organochlorine compounds were found in either the fresh water aquifer shallow well samples or in the deep borehole samples. For the shallow well samples of the first sample round, traces of hexachlorobenzene showed up in the samples and reagent and field blanks. This was perhaps due to some coeluting impurity as this compound was not detected for the last three sampling rounds.

As mentioned above, significant quantities of elemental sulfur and organosulfur compounds were present in the deep borehole samples. This created a problem since the electron capture detectors of the gas chromatograph were sensitive to these compounds. When samples were run undiluted, the result was a broad band of impurities saturating out the detectors for most of the chromatogram. Dilution factors of 100 to 20,000 were

required in order to get a clean enough baseline to properly quantitate the samples. Consequently detection limits for the organochlorine compounds were elevated.

Between the second and third sample rounds some tests were performed to evaluate the use of activated copper treatment to remove sulfur from the samples. Activated copper was prepared by treating copper powder (BDH Reagent Grade, Precipitated) with 2N HCl to remove surface oxides, rinsing with distilled water followed by acetone, drying under a nitrogen stream, and storing under isooctane to prevent oxidation. About 1 gram of activated copper was added to final extracts of samples with high sulfur content and the contents of the vials were shaken vigorously. The copper treatment was found to effectively remove a great deal of the sulfur containing impurities. An extract spiked with the organochlorine cocktail was analyzed before and after activated copper treatment. The signal for heptachlor was reduced by about 10% and for the remaining compounds was reduced by 25 to 30%. For sample rounds three and four, all final extracts for the deep borehole samples were treated with activated copper. The sulfur content was reduced sufficiently such that these samples could be run undiluted.

4. REFERENCES

1. U.S. Environmental Protection Agency, "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act; Final Rule and Interim Final Rule and Proposed Rule", Federal Register, Part VIII, 40 CFR Part 136 - Friday October 26, 1984.
2. Ibid; pp. 153-174
3. Ibid; pp. 89-104

APPENDIX C

Geophysical Logging - Sarnia Boreholes

Work Completed by Groundwater Research Group
Scarborough Campus

University of Toronto

1. INTRODUCTION

During the fall of 1987, the Groundwater Research Group at the University of Toronto undertook comprehensive geophysical logging of boreholes in the town of Sarnia in south western Ontario. One of these boreholes (MDMW-1) was drilled into bedrock to a depth of 300m. The logs from this well are described in Section 2. The remaining five boreholes were drilled simply to penetrate the overburden and ranged from 34 to 73m in depth. These wells are generally referred to as the "shallow boreholes" and are described in Section 3. A summary of the boreholes logged and the types of log run is shown in Table 1.1. The objective of this report is to present and describe the geophysical logs obtained during the study, thereby completing the current programme of geophysical research.

Table 1.1. Summary of Geophysical Logging

| | Borehole and Approximate Depth | | | | | |
|--------------------------|--------------------------------|---------------|---------------|----------------|----------------|----------------|
| | OW1-87 37m | OW2-87 47m | OW6-87 34m | OW12-87 73m | OW14-87 40m | MDMW-1 300m |
| Log | | | | | | |
| S.P. | * | * | * | * | * | - |
| 16" Normal Resistivity | * | * | * | * | * | * |
| 64" Normal Resistivity | * | * | * | * | * | * |
| Single Point Resistance | * | * | * | * | * | * |
| Natural Gamma | * | * | * | * | * | * |
| Gamma-Gamma | - | - | - | - | - | * |
| Caliper | - | - | - | - | - | * |
| Fluid Resistance | - | - | - | - | - | * |
| Temperature | - | - | - | - | - | * |
| Differential Temperature | - | - | - | - | - | * |

* Log run
- Log not run

2. DEEP BOREHOLE MDMW-1

The deep borehole MDMW-1 was the primary focus of the borehole geophysical investigations. This borehole was drilled towards the end of September, 1987. Following its completion, the borehole was flushed to remove drilling fluids and borehole logging commenced almost immediately, the work beginning on October 1st. As shown on Table 1.1, a relatively full set of logs were run. These logs included 16" and 64" normal resistivity, natural gamma, gamma-gamma (density), caliper, temperature, differential temperature and fluid resistivity. A brief description of the geophysical principles behind these logs is contained in the Appendix. A spontaneous potential (S.P.) log was not attempted as the borehole had been flushed. This type of activity disturbs the equilibrium conditions necessary for the development of stable electrochemical potentials.

The MDMW-1 logs are presented in Figure 2.1. All depths are shown in metres with respect to local ground level. The lithological classifications accompanying the logs were made available by INTERA following a brief, preliminary interpretation of the borehole cores.

2.1 Normal Resistivity, Gamma and Gamma-Gamma Logs

The electric logs (16" normal resistivity (short normal), 64" normal resistivity (long normal), and single point resistance), the gamma log and the gamma-gamma log are primarily used to provide objective information on the down-hole geology.

As described in Appendix A.2, the electric logs respond primarily to variations in the formation porosity and the resistivity of the contained fluid. Formation waters are generally conducting; hydrocarbons are essentially non-conducting. Shales, particularly those containing brackish

formation water, show characteristically low values of resistivity, whilst sandstones and limestones produce higher values, the magnitudes depending primarily on the degree of water saturation (as opposed to hydrocarbon saturation) and the salinity of the pore fluids.

Natural gamma logs, in contrast, respond to natural gamma radiation emitted by radioactive isotopes. ^{40}K is the most abundant natural emitter of gamma radiation. The isotope also happens to be a very common constituent of clay minerals. As a consequence, clay-rich shales generally exhibit a high gamma response when compared to "cleaner" sandstones and limestones. The ^{40}K isotope is responsible for the gamma radiation observed in the vast majority of situations. One important exception occurs in the case of organic or "bituminous" shales where extremely high gamma radiation is emitted by radioactive isotopes of uranium.

Despite its similar nomenclature, the gamma-gamma log is strictly a "density log" and responds primarily to variations in mineral content and porosity. It generally has a very low depth of investigation and can be significantly influenced by variations in borehole diameter. While this log can provide a fairly reliable measure of rock porosity, it is unable to determine the nature of the fluid within the pores, except perhaps to distinguish gases from liquids.

The resistivity, single point resistance, gamma and gamma-gamma logs shown for MDMW-1 in Figure 2.1 illustrate these general geophysical principles, and in doing so, display variations that reinforce the geologic interpretations. First, in considering the three electric logs, it is clear they correlate well with each other, with other logs and, in a more general sense, with the broadly defined geologic units. There are however, two minor exceptions: i) the single point resistance shows an unusual peak at about 255m (denoted by A in Figure 2.1) and ii) the single point resistance response is relatively subdued, failing in particular to respond positively to resistive beds in the Lucas Formation. The unexpected peak is simply an electrical interference anomaly, a frequent problem in urban and industrial areas such as Sarnia, where spurious ground currents are not unusual. The problem is exacerbated by the type of electrode

arrangement used in the single point tool which makes it particularly prone to interference effects. The subdued response of the point resistance log is explained by the limited range of depth of investigation of the tool. As a result the log tends to be unduly influenced by the properties of the borehole fluid, a particular problem when the borehole fluid is highly conducting, a feature confirmed by the very low values of resistivity (<1 ohm-m) revealed by the fluid resistivity log.

The 16" and 64" normal resistivity logs are less influenced by either electrical interference or the properties of the borehole fluid. The borehole fluid does affect the 16" normal log to some extent and explains why this log generally registers lower values of apparent resistivity than the 64" normal. Fortunately, despite the high salinity of the borehole fluid, these effects are minimized by the small hole diameter which is considerably less than the 16" AM electrode spacing of the short normal tool.

For the purposes of log description and discussion, the electric logs are best examined alongside the gamma and gamma-gamma logs. Beginning at the top of the sequence, where casing interrupts the electric logs' measurement, the junction between the overburden and the uppermost Kettle Point Shale is clearly revealed by a sharp increase in density (B) and an extremely high gamma radiation response (C). The increased density is consistent with the transition from an unconsolidated surficial deposit to a highly indurated shale. However, the extremely high gamma response of the shale (>300 counts/sec through steel well casing) is more unusual and almost certainly indicates the presence of uranium precipitated by organic material. Similar organic rich shales have been recognized at many other localities throughout southern Ontario (see references by Johnson).

The organic rich shales are approximately 15m thick and occupy all but the lower 3 or 4m of the Kettle Point Shale. While it would appear from the logs that the organic rich shales comprise two units separated at D, the sharp change in the logs at this point is an artifact of the casing depth. Above D, the casing absorbs a significant amount of the gamma radiation. Below D, in open hole, the gamma

response from the shales is so high that it contributes significantly to the amount of radiation detected by the gamma-gamma tool. As a result of this interference, the gamma-gamma registers an anomalously low density in the zone denoted by E.

The junction between the Kettle Point Shale and the underlying Hamilton Group appears to be demarcated by an extremely pure carbonate bed with a gamma response as low as 10 counts/sec (F). This bed has a density of 2.7 suggesting a relatively low porosity (<10%) depending on the mineral content (calcite/dolomite). Between approximately 50 and 83m below surface (F to G), the Hamilton Group is dominated by carbonates with frequent shale interruptions. The shales exhibit very low values of resistivity (<10 ohm-m) and relatively high gamma counts (>100 counts/sec) while the carbonates show a very low gamma response and significantly higher values of resistivity (up to 80 ohm-m). It is significant that although the carbonates display elevated values of resistivity, these values remain extremely low. Assuming that the porosity of these carbonates is in the range 5 to 10%, a resistivity value of the order of 50 to 100 ohm-m indicates that the pore water is highly saline with a total dissolved solids content in the range 5,000 to 20,000 mg/L. Below G, the remainder of the Hamilton Group is dominated by shales with just two, perhaps three carbonates of any significance (H), all saturated with saline pore waters.

The boundary between the Hamilton Group and underlying Dundee Formation is extremely well portrayed by the geophysical logs. It is marked by a sharp drop in the gamma response showing the return to relatively clean carbonate lithologies, and by a rapid increase in resistivity to values of the order of 300 ohm-m. Unfortunately, in the absence of an S.P. log, the salinity of the formation fluids is not known. However, if it can be assumed that the formation waters within these carbonates are as saline or more saline than the waters in the overlying Hamilton Group, then the relatively high resistivity values can be explained only by a relatively low percentage water saturation with the remaining pore space being occupied with hydrocarbons. Such an interpretation would appear to be consistent with traces

of oil observed on the borehole cores. Significantly, whereas the 16" and 64" normal logs showed similar values of resistivity for the carbonates in the Hamilton Group, values of 16" normal resistivity tend to be significantly lower than the 64" normal resistivity values in these deeper formations. This difference is due to the invasion of drilling fluids into the carbonates, displacing the more resistive hydrocarbons laterally. The 16" normal resistivity log with its limited range of depth measurement tends to provide a measure of resistivity of the invaded zone where it is present, while the 64" normal log is able to provide a better quantitative assessment of the resistivity beyond the invaded zone.

From the top of the Dundee Formation at about 143m to a point J, mid-way through the Lucas Formation at a depth of about 240m, the carbonate sequence retains its clay free character and displays a gamma response consistently in the range 5 to 20 counts/sec. Variations in resistivity are difficult to interpret without a detailed knowledge of mineral character, porosity and formation water salinity. However, for the most part, the broader variations most likely reflect relative changes in water and hydrocarbon content. Clearly, the resistivity data have only limited interpretive use in this depth range. However, an important change in the gamma-gamma (density) response at a depth of 185m (K), broadly at the postulated transition between the Dundee and underlying Lucas Formation, does provide valuable additional information. As shown by the log the character of the gamma-gamma response changes radically. Above K, it indicates a relatively consistent density of 2.5 g/cc; below K to the base of the Lucas Formation the density becomes highly variable and ranges between 2 and 3 g/cc, averaging close to 2.4 g/cc. To some extent the variations may indicate the presence of evaporite beds. Gypsum and halite display characteristically low values of density (2.32 and 2.165 g/cc respectively), while anhydrites have an unusually high density of 2.96 g/cc. Certainly anhydrite beds must be responsible for the high density peaks at L. However, the numerous low density peaks and the broad low density zones between K and K' and at M probably reflect large increases in porosity, either due to fracturing or to increased dolomite vugginess. It is significant that the low density

zones appear to correlate with zones identified by INTERA (data not presented here) as having a relatively high permeability.

There are few lithological changes of significance towards the bottom of the hole. Below J a slight increase in the clay content of the carbonate is indicated by a marginal increase in gamma response. The relatively low resistivity values are indicative of saline formation waters and high water saturation percentages. Also, with the exception of zone M described above, the gamma-gamma (density) response becomes more regular, indicating densities within the range 2.4 to 2.6 g/cc.

2.2 Caliper Logs

The caliper log run in MDMW-1 was extremely fine tuned to respond to borehole diameter variations as small as 1mm. Under these circumstances it can be seen that the greater part of the hole is extremely smooth walled. With the exception of the Hamilton Group where small but significant changes occur, caliper deflections throughout the remainder of the hole are limited to isolated displacements of less than 2 to 3mm (arrowed). Even within the Hamilton Group, changes in borehole diameter are not as great as they may first appear. Maximum borehole diameters in this zone are 150mm (6"), representing an increase of approximately 50mm (2") relative to initial borehole diameter. Most of the broader increases in borehole diameter are probably associated with drilling operations. The origin of the sharper deflections is more speculative, however, and while drilling effects may play a role, it is suspected that the deflections are indicative of pervasive fractures. It is significant, for example, that the displacements at N are correlative with sharp gamma-gamma deflections (N'), suggesting that the features are extensive enough to cause substantial changes in local rock density. These density changes may be the result of i) large increases in porosity, and/or ii) the presence of low density gases in the rock pore space. It should be noted that the low density deflections do not appear to correlate with carbonate units, and are developed solely within the shale.

2.3 Fluid Logs

The fluid logs include temperature, differential temperature and fluid resistivity. Ideally these logs should either be run i) following a long period of rest during which time the borehole fluid can achieve equilibrium with its surroundings or ii) following a controlled episode of pumping which draws water from fracture zones thus creating anomalies in the temperature and fluid resistivity profiles that allow their ready recognition. Although neither of these ideals was even remotely met, the fluid logs shown in Figure 2.1 do merit careful attention.

The most significant feature of the fluid logs is the highly disturbed temperature profile. This disturbance is shown most prominently by the differential temperature log which displays a highly fluctuating response throughout the length of the borehole. Interpretation of the temperature logs is seriously complicated by the hydraulic disequilibrium that resulted from the well drilling and from the flushing of the borehole. Nevertheless there are several levels at which major changes in log characteristics occur and these likely indicate the movement of fluid into or out of the well. In this regard, important indicators of flow are i) in the vicinity of P at a depth of about 190m where the differential temperature log is highly agitated and locally deflects off scale; ii) at Q and R where sharp differential temperature deflections are recorded, and iii) at S, T and U where the differential temperature logs undergo significant changes in trend. In the vicinity of U, the log actually shows cooling with depth over a distance of several metres. Perhaps significantly, several of the features (for example, P, T, R and U) are coincident with zones or horizons of relatively low density (higher porosity).

The fluid resistivity log is the last of the fluid logs presented here. It is used to determine the salinity of the water contained within the borehole column. This water may or may not be representative of water within the formation adjacent to the borehole. As shown by Figure 2.1 the fluid resistivity is extremely low throughout the borehole, varying between 0 and 0.3 ohm-m. This is equivalent to a total

dissolved solids concentration in excess of 20,000 mg/L. Unlike the temperature log which is highly disturbed by flow conditions within the hole, the fluid resistivity log remains remarkably steady. Some oscillation occurs towards the top of the hole which is believed to be caused by gases bubbling up through the device and interrupting the flow of electrical current. This disturbance (or "noise") is not present below V.

3. SHALLOW BOREHOLES

3.1 Range of Logs.

Five of the six boreholes logged were drilled to intercept the top of the bedrock. As indicated in Table 1.1, only five logs were run in these holes, four electric logs and a natural gamma log. A gamma-gamma log was not attempted in the holes due to the risk of borehole collapse and the consequent potential loss of a radioactive source. The fluid logs (fluid resistance, temperature and differential temperature) were not run as the boreholes were newly drilled and contained drilling mud which was totally unrepresentative of formation conditions.

3.2 Log Description/Interpretation

The logs from the shallow boreholes are shown in Figures 3.1 to 3.5 for boreholes OW1-87, OW2-87, OW6-87, OW14-87 and OW12-87 respectively. All depths are shown in metres with respect to ground level. With the exception of borehole OW12-87 which was 73m deep, all the shallow boreholes are very shallow and range between 34m and 47m in depth.

In general, the logs are relatively featureless, a characteristic that suggests very little variation in the nature of the materials. Logs from the four "40m" wells show virtually identical results. There is a general increase in gamma ray response from about 50/100 counts/sec near the surface to about 200 counts/sec at about 15 or 20 m in wells OW1-87 and OW2-87, and at 5 or 10m in wells OW6-87 and OW14-87. This change indicates a gradual increase in the clay to

sand ratio of the sediments. The response of about 200 counts/sec recorded throughout the greater depth of the wells is indicative of clays with little or no sand/silt content. Resistivity values of approximately 50 ohm-m are consistent with this interpretation. There is no evidence of coarse grained material in any of the holes. The S.P logs are less easily interpreted. Here, the problem appears to be caused by the inconsistent chemical quality of the borehole mud, a problem that may have been caused when the the well intercepted bedrock and the muds were diluted with formation waters. Under normal conditions, S.P. logs tend to form mirror images with the resistivity/resistance logs. This type of response is demonstrated by the logs from OW6-87 shown in Figure 3.3. S.P logs and resistivity logs from well OW1-87, in Figure 3.1, however, are virtually identical. This suggests that the S.P. response has been reversed, a problem which can occur when the borehole mud is more saline than the formation water. Given these difficulties, the S.P logs must be interpreted with considerable caution.

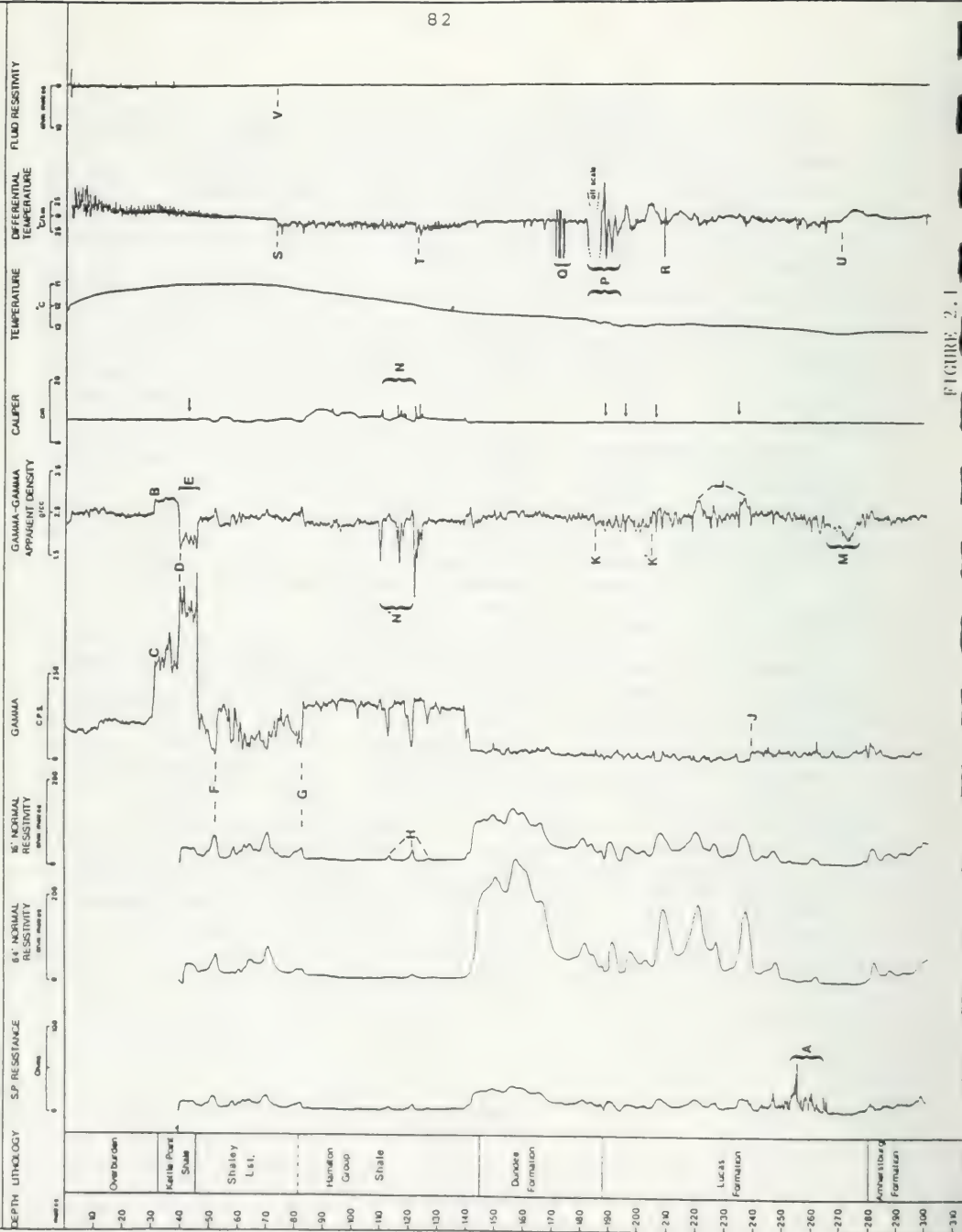
Logs from the slightly deeper hole (OW12-87) in Figure 3.5 are generally similar to the "40m" wells, down to a depth of about 35/40m. Below this depth there is a gradual decrease in gamma ray response accompanied by an increase in resistivity. This transition occurs over a depth interval of 10m and is indicative of a slightly decreasing clay content. Below a depth of approximately 48m, the logs stabilize and remain unchanged to the bottom of the hole.

In summary, logs from the five shallow wells reveal little variation in the lithological character of the overburden sediments. These sediments are predominantly clays, although some coarser material (silts and sands) do appear towards the top of the sequence. There is no evidence to suggest the existence of significant sand and/or gravel units anywhere in the succession.

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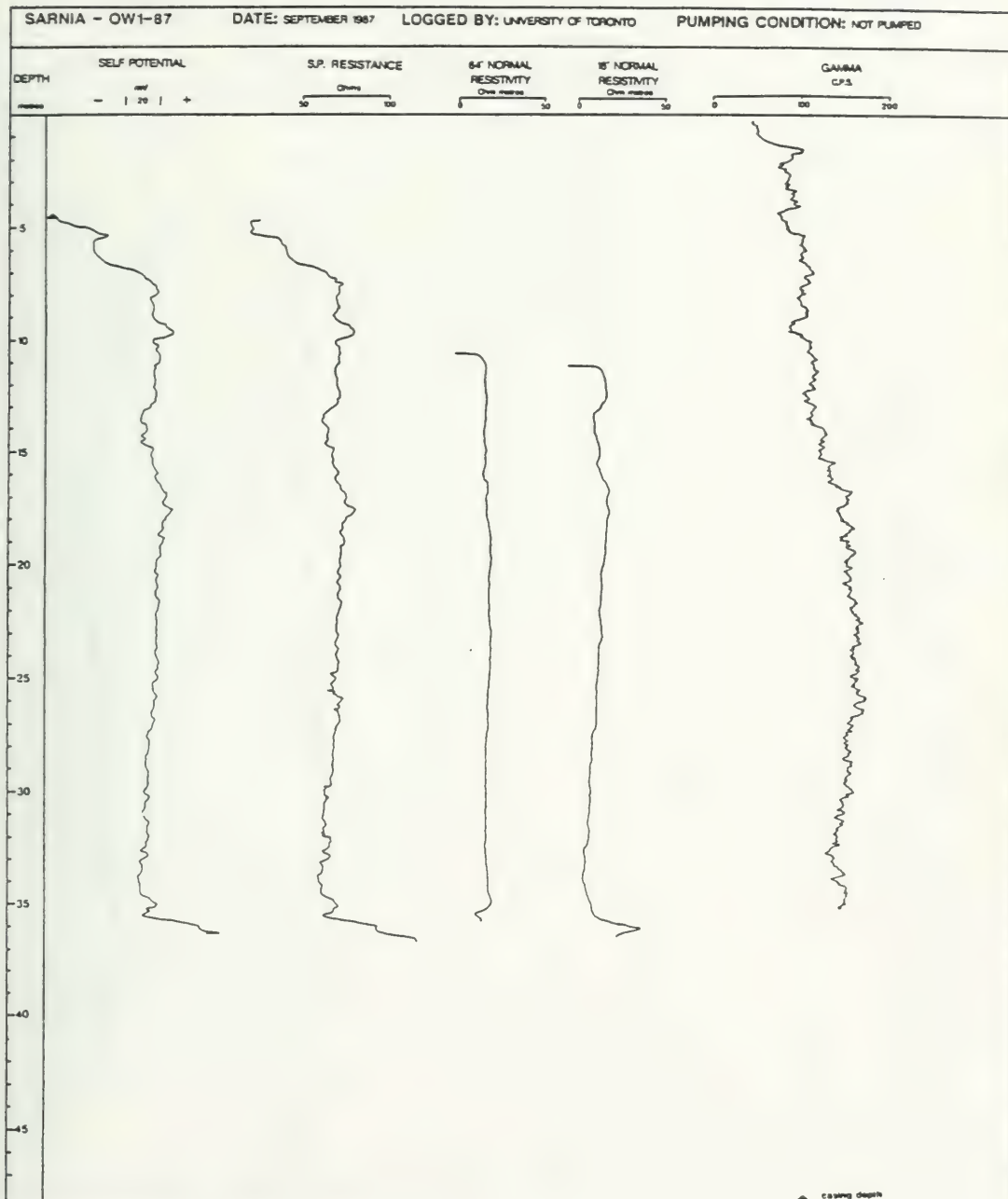


FIGURE 3.1

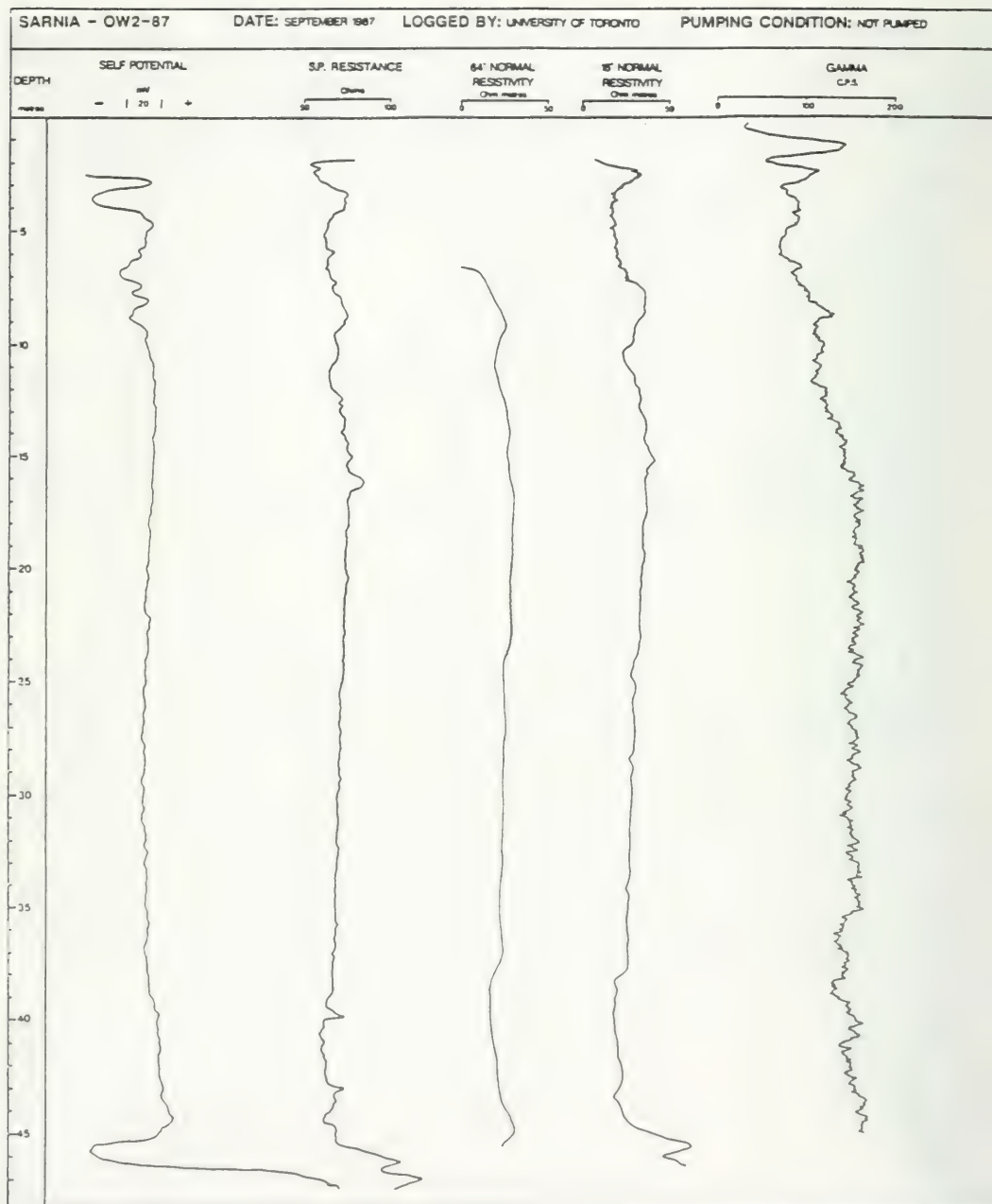


FIGURE 3.2

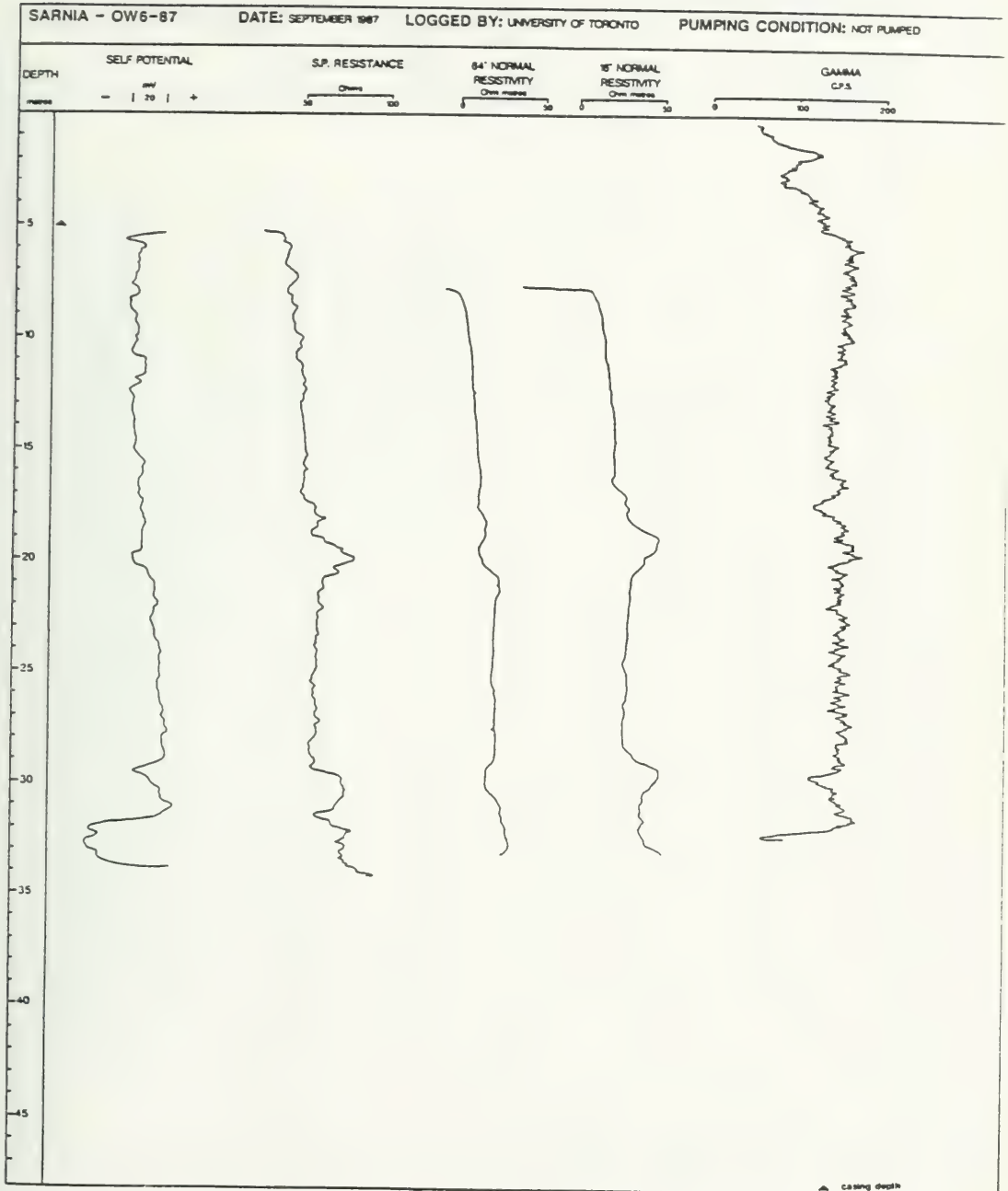


FIGURE 3.3

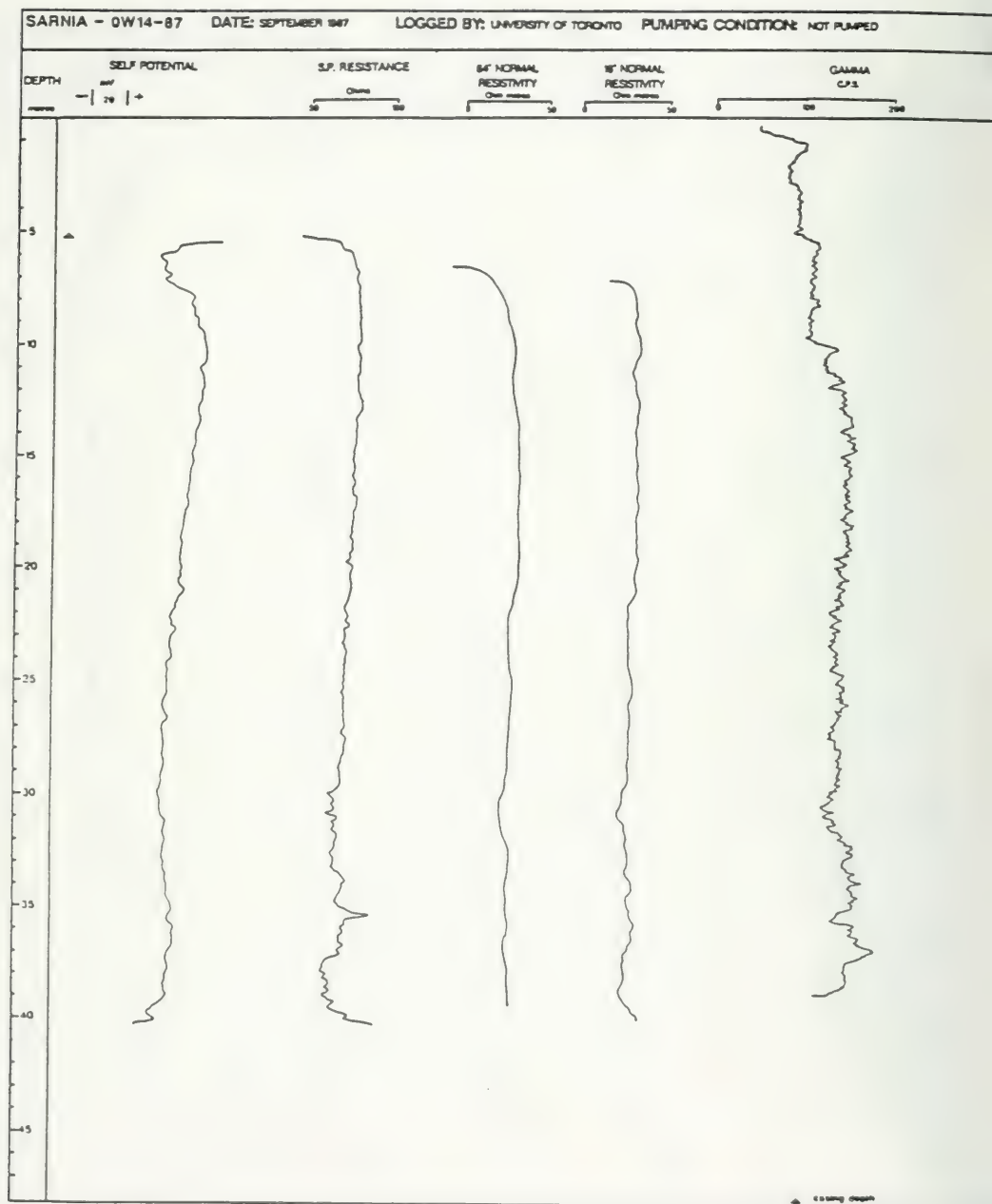


FIGURE 3.4

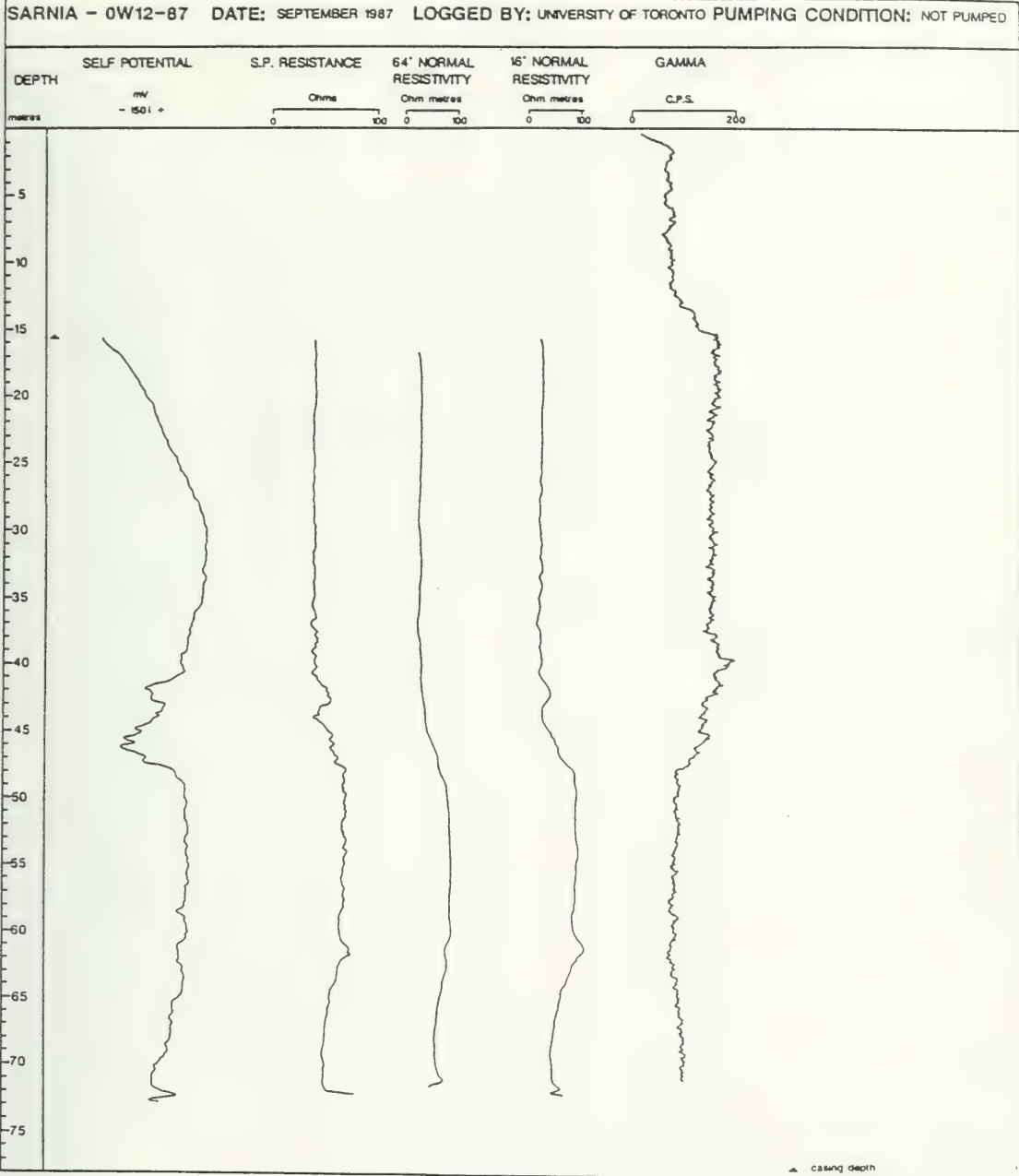


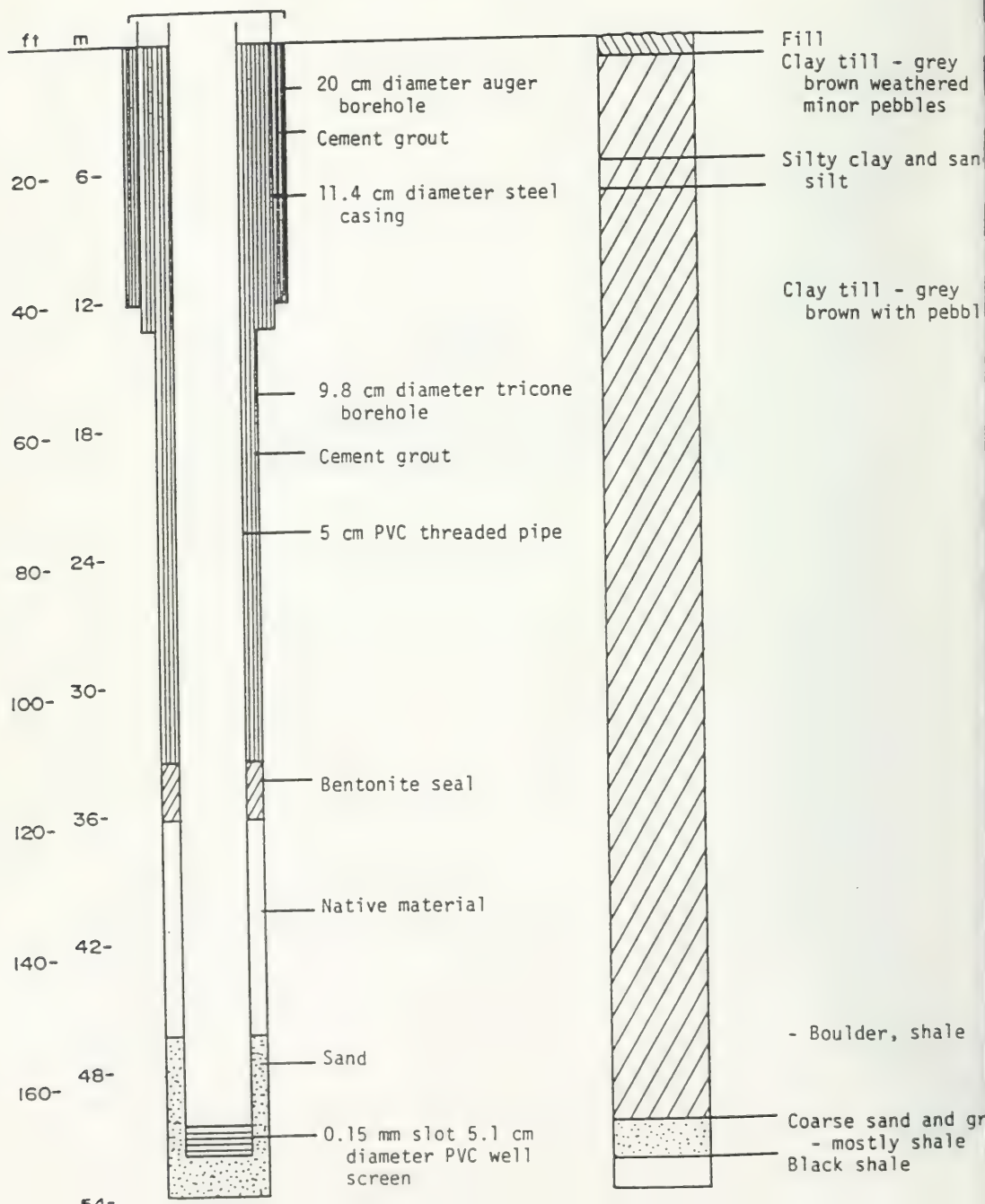
Figure 3.5

APPENDIX D

Stratigraphic and Instrumentation Logs
1985, 1986 and 1987 Monitoring Well Series

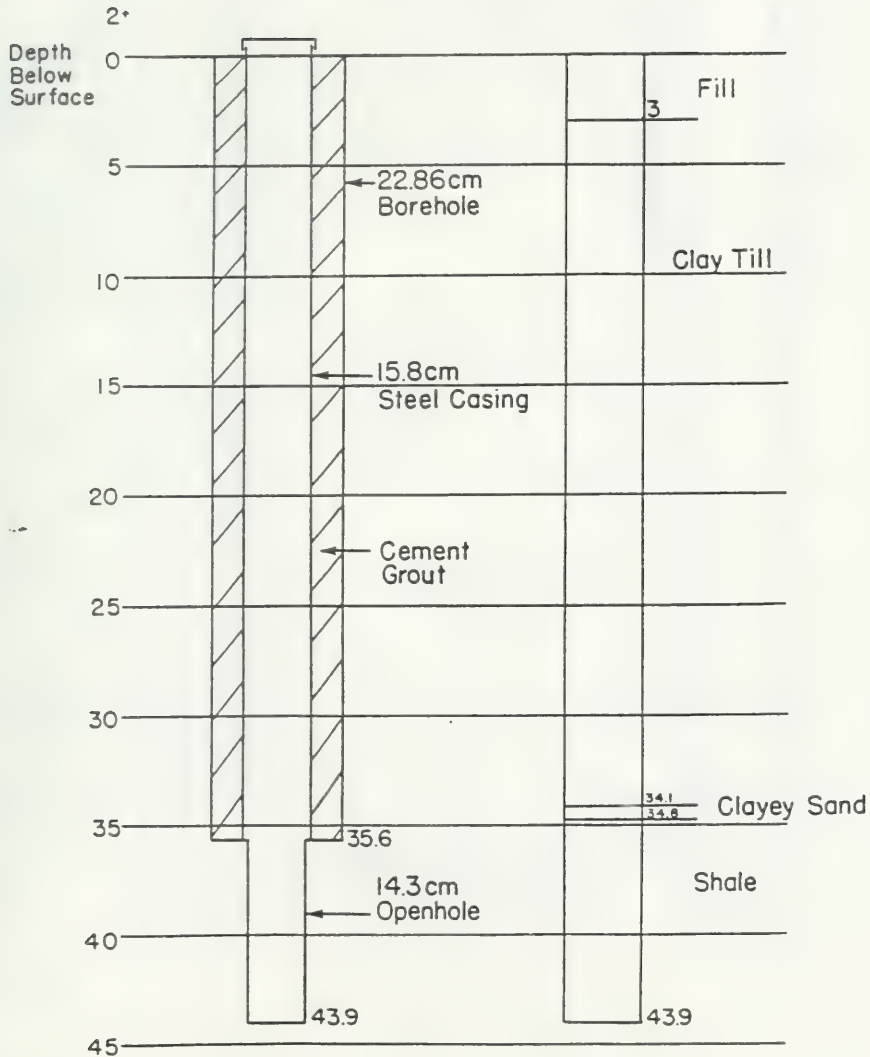
APPENDIX D1

Stratigraphic and Instrumentation Logs
1985 Monitoring Well Series
(Reproduced from GTC 1985 and INTERA, 1986)

ESSO MONITORING WELL 1-85

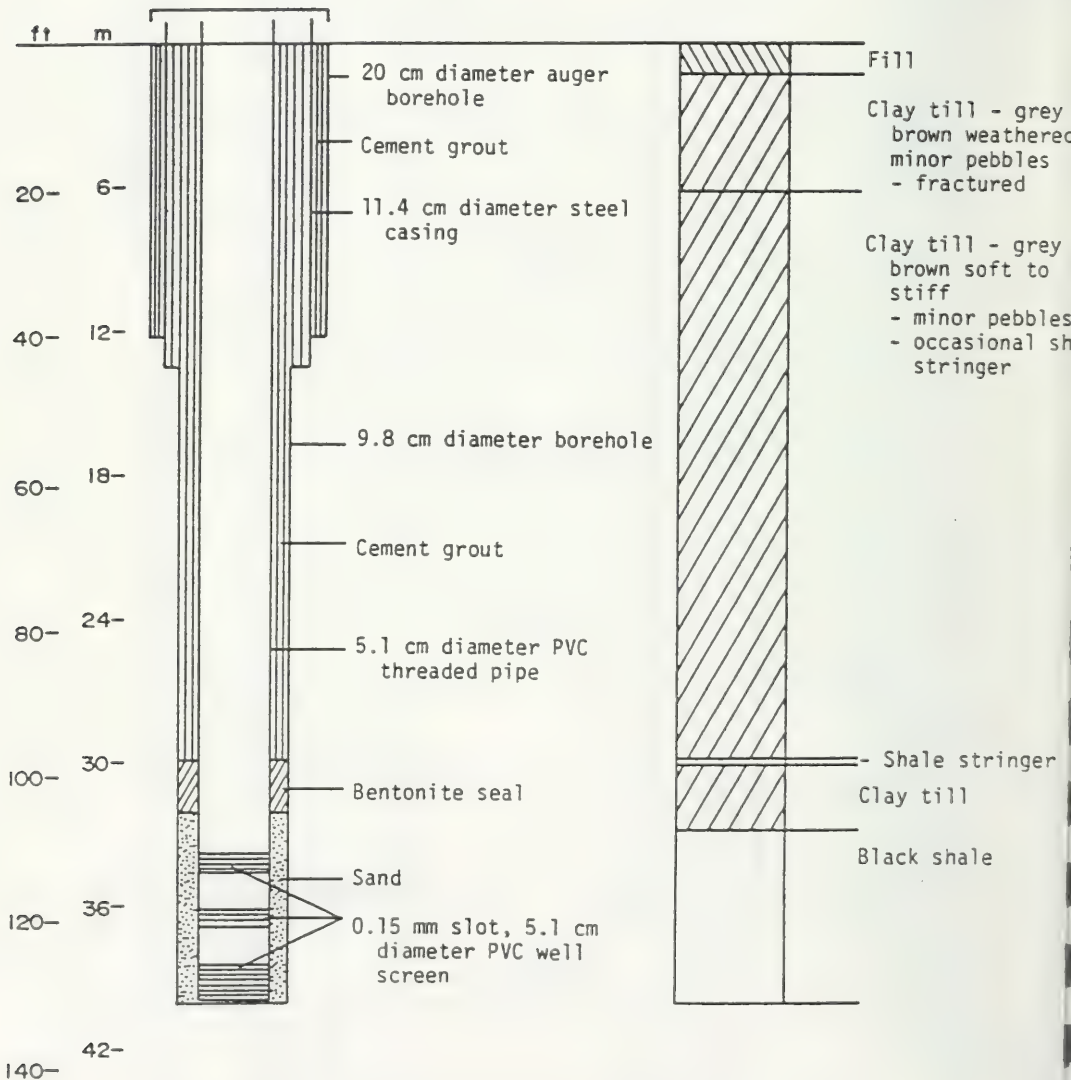
2-85

Mitton Street Well



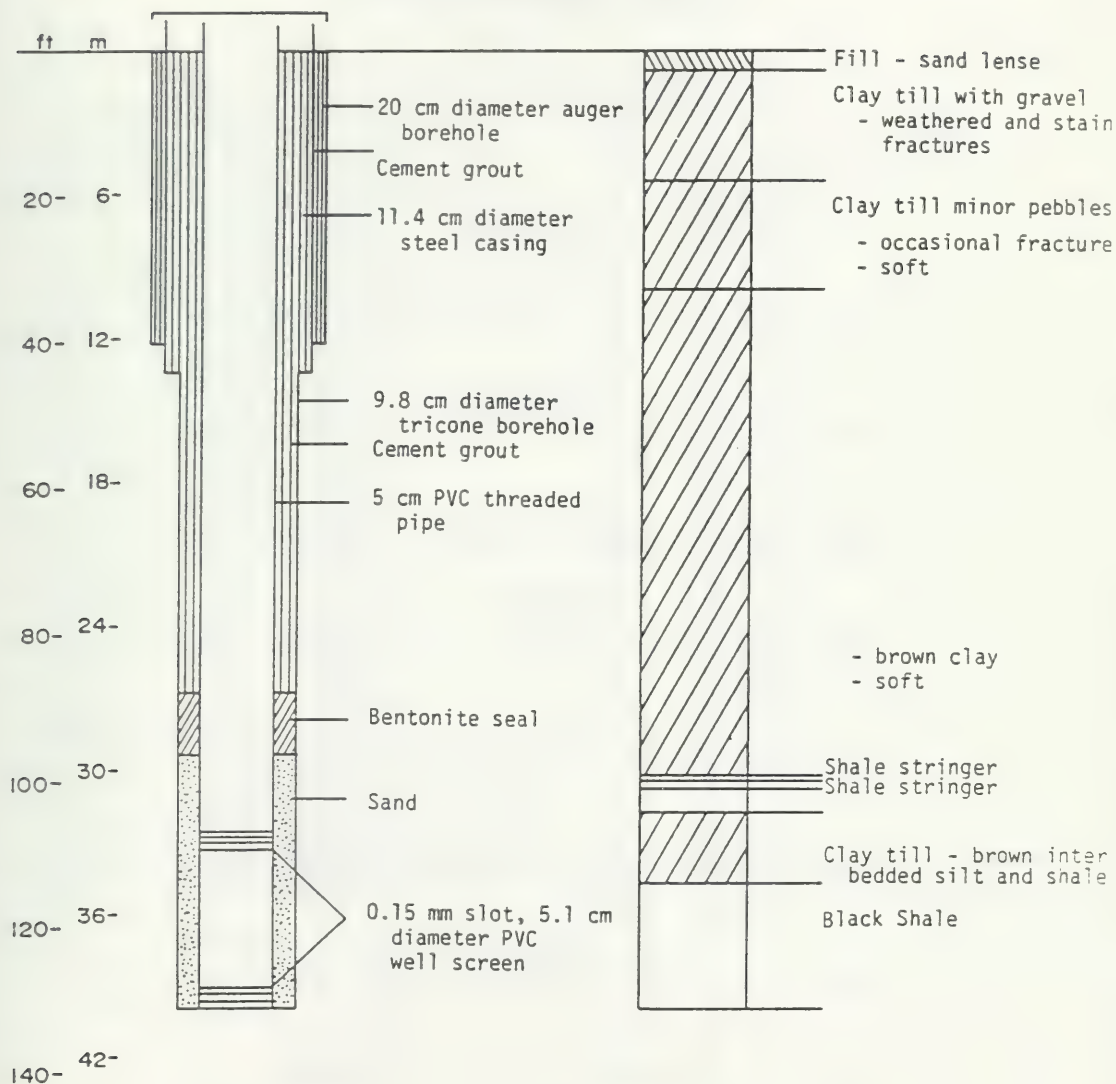
MOE -1 MONITORING WELL

3-85



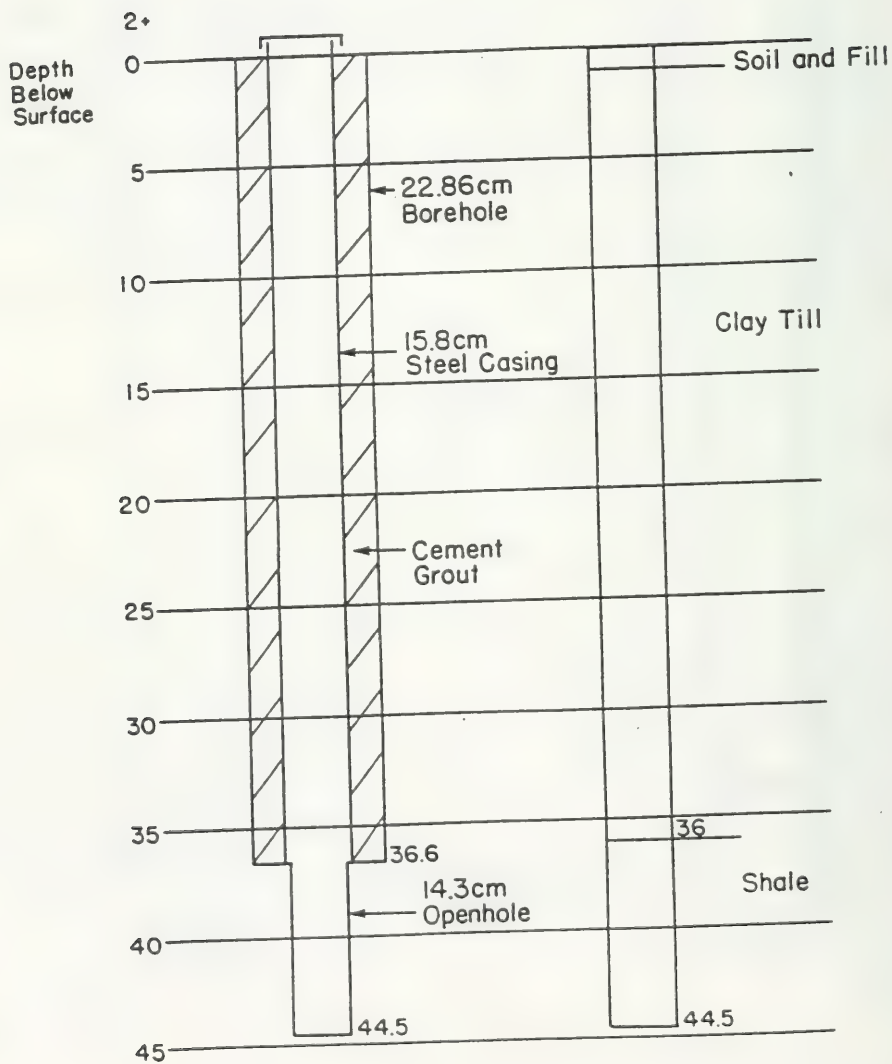
DOW MONITORING WELL

4-85



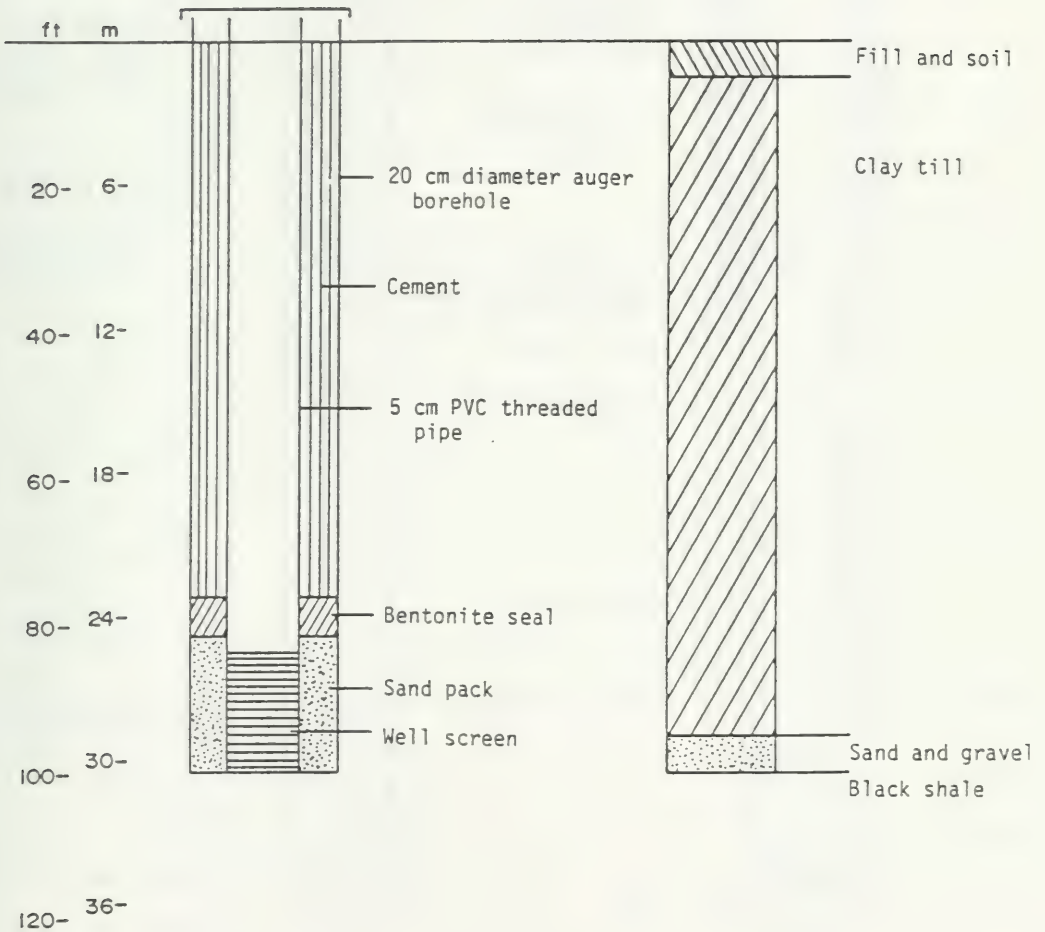
5-85

Sarnia Indian Reserve Well



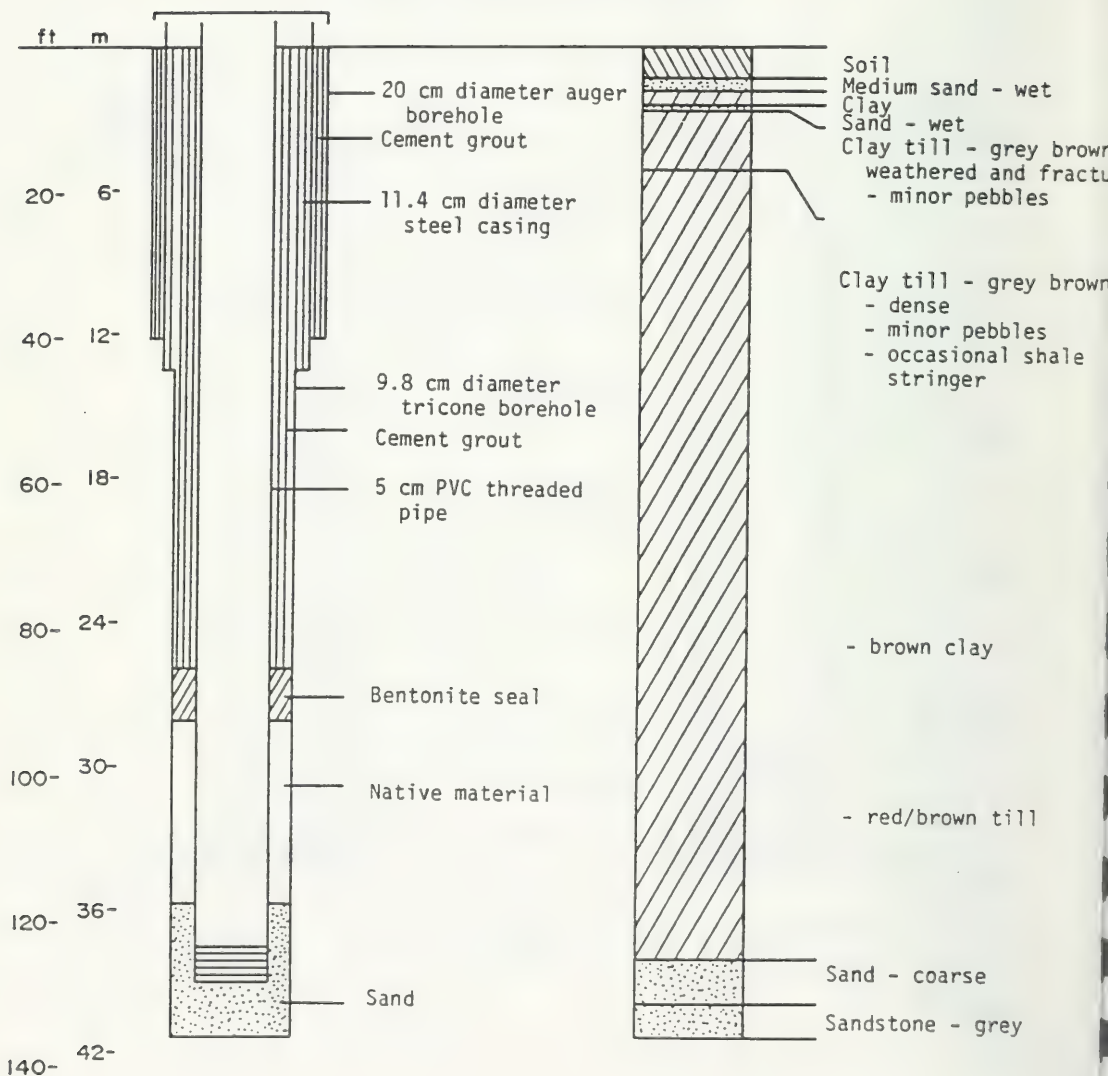
MOE - 2 MONITORING WELL

6-85



CIL MONITORING WELL

7-85



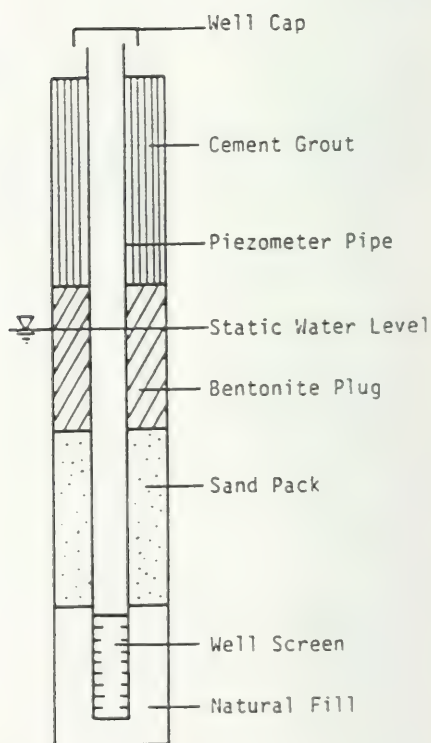
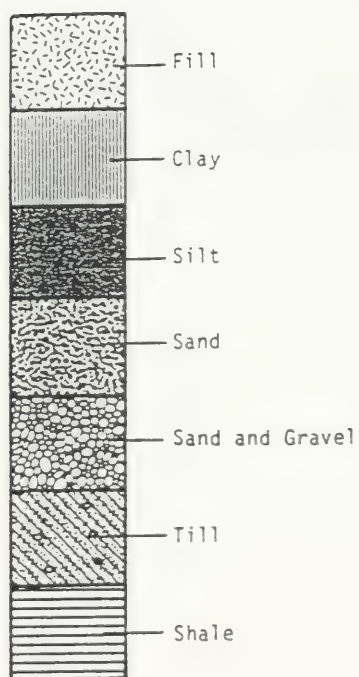
APPENDIX D2

Stratigraphic and Instrumentation Logs
1986 Monitoring Well Series
(Reproduced from INTERA, 1987)


Legend

1986

Stratigraphic & Instrumentation Logs





STRATIGRAPHIC AND INSTRUMENTATION LOG



| PROJECT NAME AND No.: EC/SARNIA, H87-019 | | | | BOREHOLE No.: Prince of Wales Park Deep Well (#1) 1-86 | |
|--|-------------------|---|---------------------|--|--|
| CLIENT: Environment Canada | | | | DATE COMPLETED: November 20, 1986 | |
| LOCATION: Sarnia | | | | DRILLING METHOD: Mud Rotary (5 1/8 in.) | |
| REFERENCE ELEVATION: 182.785 m AMSL | | | | DRILL SUPERVISOR: Andy Backus | |
| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION | |
| 0 | | Fill - black shaley gravel | 182.79 |  | |
| | | Sand - tan sand with minor clay and silt | 181.27 | | |
| | | Clay - minor fine sand | 180.35 | | |
| | | Sand - fine sand | 177.61 | | |
| | | Till - grey clayey till - minor fine sand and pebbles | 174.26 | | |
| 10 | | | | | |
| 20 | | | | | |
| 30 | | | | | |
| 40 | | | | | |
| 50 | | Bedrock - shale with quartz veins | 130.06 128.54 | | |
| 60 | | | | | |

Water level for March 23, 1987





STRATIGRAPHIC AND INSTRUMENTATION LOG

| PROJECT NAME AND No.: EC/SARNIA, H87-019 | | | BOREHOLE No.: Prince of Wales (shallow #2) 2-86 | |
|--|-------------------|---|---|---|
| CLIENT: Environment Canada | | | DATE COMPLETED: November 20, 1986 | |
| LOCATION: Sarnia | | | DRILLING METHOD: Mud Rotary (5 1/8 in.) | |
| REFERENCE ELEVATION: 182.685 m AMSL | | | DRILL SUPERVISOR: Andy Backus | |
| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
| 0 | |  Fill - black shaley gravel Sand - tan sand with minor clay and silt Clay - minor fine sand Sand - fine sand Till - grey clayey till - minor fine sand and pebbles | 182.685 181.27 180.35 177.50 174.26 172.63 |  179.845 |
| 10 | | | | |
| 20 | | | | |
| 30 | | | | |
| 40 | | | | |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG


| PROJECT NAME AND No.: EC/SARNIA, H87-019 | | | BOREHOLE No.: Prince of Wales Pumping Well (#3) 3-86 | |
|--|-------------------|--|---|--|
| CLIENT: Environment Canada | | | DATE COMPLETED: December 2, 1986 | |
| LOCATION: Sarnia | | | DRILLING METHOD: Mud Rotary (8 in.) | |
| REFERENCE ELEVATION: 181.145 m AMSL | | | DRILL SUPERVISOR: Andy Backus | |
| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
| 0 | | Clay - assumed clay - no return | 181.15 |  177.07  |
| 10 | | Clay - grey clay with minor sand - coarsens with depth | 172.01 | |
| 20 | | | | |
| 30 | | | | |
| 40 | | | | |
| 50 | | Bedrock - shale | 130.25 | |
| 60 | | | 126.29 | |
| Water level for March 23, 1987 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

| PROJECT NAME AND No.: EC/SARNIA, H87-019 | | | BOREHOLE No.: Victoria Park (#4) 4-86 | |
|--|-------------------|---|---|--|
| CLIENT: Environment Canada | | | DATE COMPLETED: November 26, 1986 | |
| LOCATION: Sarnia, | | | DRILLING METHOD: Mud Rotary (5 1/8 in.) | |
| REFERENCE ELEVATION: 181.515 m AMSL | | | DRILL SUPERVISOR: Andy Backus | |
| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
| 0 | | Clay - tan clay - minor sand | 181.52 |  177.04  |
| | | Sand | 178.47 | |
| | | Clay - grey clay - minor sand and occasional pebble | 175.42 | |
| 10 | | | | |
| 20 | | | | |
| 30 | | | |  177.04  |
| 40 | | | | |
| 50 | | Sand | 128.48 | |
| | | Bedrock - shale | 127.88 | |
| | | | 126.35 | |
| 60 | | | | |

Water level for March 23, 1987


STRATIGRAPHIC AND INSTRUMENTATION LOG

| PROJECT NAME AND No.: EC/SARNIA, H87-019 | | | BOREHOLE No.: Huron/Tasimoo (#5) 5-86 | |
|--|-------------------|--|---|--|
| CLIENT: Environment Canada | | | DATE COMPLETED: November 21, 1986 | |
| LOCATION: Sarnia | | | DRILLING METHOD: Mud Rotary (5 1/8 in.) | |
| REFERENCE ELEVATION: 183.455 m AMSL | | | DRILL SUPERVISOR: Andy Backus | |
| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
| 0 | | Fill - grey sandy clay - occasional pebbles | 183.45 |  |
| 10 | | Till - grey clay till - minor sand and clasts | 177.35 | |
| 20 | | Silt - grey clayey silt - minor fine sand mixed with granules of black shale - coarsens with depth | 165.16 | |
| 30 | | Bedrock - shale | 149.92 148.40 | |
| 40 | | | | |
| 50 | | | | |
| 60 | | | | |

Water level for March 23, 1987


STRATIGRAPHIC AND INSTRUMENTATION LOG

| | |
|--|---|
| PROJECT NAME AND No.: EC/SARNIA, H87-019 | BOREHOLE No.: Sludge Lagoon (#6) 6-86 |
| CLIENT: Environment Canada | DATE COMPLETED: November 25, 1986 |
| LOCATION: Sarnia | DRILLING METHOD: Mud Rotary (5 1/8 in.) |
| REFERENCE ELEVATION: 190.760 m AMSL | DRILL SUPERVISOR: Andy Backus |


| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|---|---------------------|--|
| 0 | | Sludge - black, rubbery material mixed with clay and sand - smells of organics | 190.76 |  |
| 10 | | Till - sandy grey clay till - occasional pebble | 181.62 | |
| 20 | | | | |
| 30 | | | | |
| 40 | | Bedrock - shale | 152.36 150.83 | |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

| | | | |
|-----------------------|--------------------|-------------------|-----------------------------|
| PROJECT NAME AND No.: | EC/SARNIA, H87-019 | BOREHOLE No.: | Canadian National (#7) 7-86 |
| CLIENT: | Environment Canada | DATE COMPLETED: | November 28, 1986 |
| LOCATION: | Sarnia | DRILLING METHOD: | Mud Rotary (5 1/8 in.) |
| REFERENCE ELEVATION: | 182.620 m AMSL | DRILL SUPERVISOR: | Andy Backus |

| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|---|---------------------|--|
| 0 | | Fill | 182.62 |  |
| 10 | | Clay - minor fine sand - occasional small pebble | 176.53 | |
| 20 | | | | |
| 30 | | | | |
| 40 | | | | |
| | | Sand - coarse sand and granule sized particles | 141.79 | |
| | | Bedrock - shale | 141.48 | |
| | | | 138.43 | |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

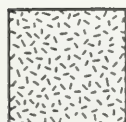
| PROJECT NAME AND No.: EC/SARNIA, H87-019 | | | BOREHOLE No.: Hydro Tower (#8) 8-86 | |
|--|-------------------|--|---|--|
| CLIENT: Environment Canada | | | DATE COMPLETED: November 28, 1986 | |
| LOCATION: Sarnia | | | DRILLING METHOD: Mud Rotary (5 1/8 in.) | |
| REFERENCE ELEVATION: 184.015 m AMSL | | | DRILL SUPERVISOR: Andy Backus | |
| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
| 0 | | Sand | 184.02 |  |
| | | Clay - grey clay - minor sand and pebbles | 177.92 | |
| 10 | | | | |
| 20 | | | | |
| 30 | | | | |
| | | Bedrock - soft shale | 150.49 148.05 | |
| 40 | | | | |
| 50 | | | | |
| 60 | | | | |
| | | Water level for March 23, 1987 | | |

APPENDIX D3

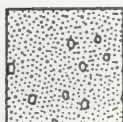
Stratigraphic and Instrumentation Logs
1987 Monitoring Well Series

Legend
1987

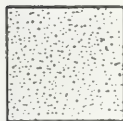
Stratigraphic & Instrumentation Logs



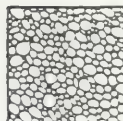
Fill



Till



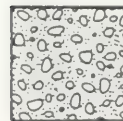
Sand



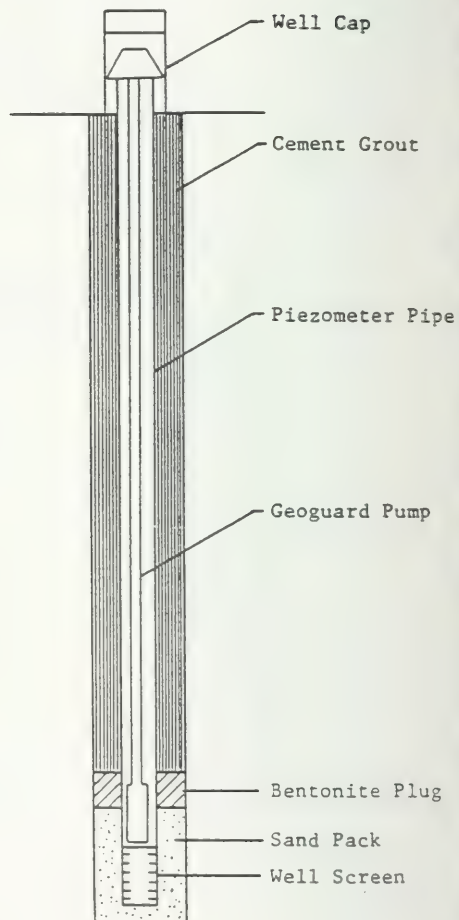
Fresh Water Aquifer



Shale



Sandy Clay Till



STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME AND No.: Sarnia, H87-039

BOREHOLE No.: MSMW-1-87

CLIENT: Ontario Ministry of the Environment

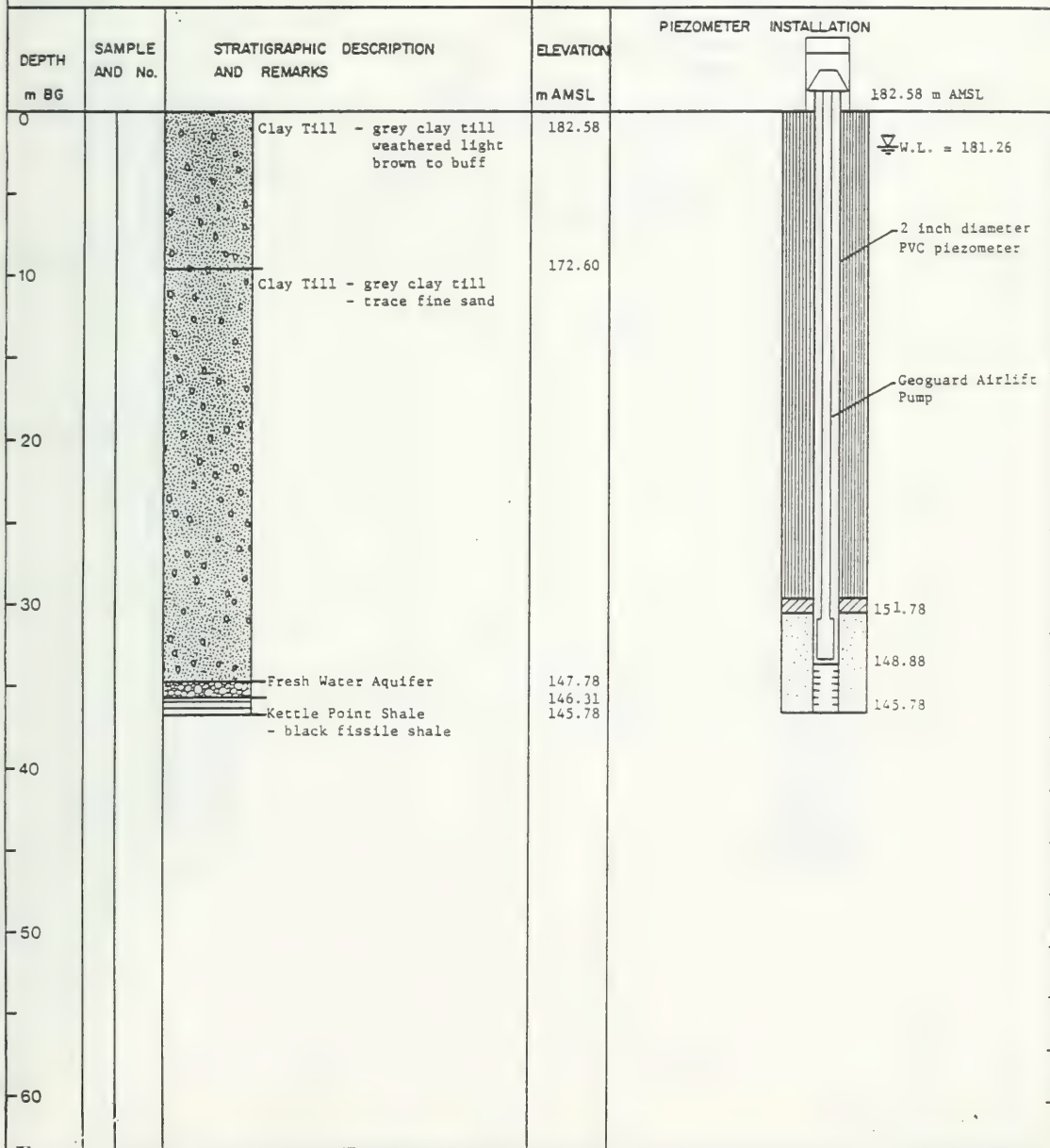
DATE COMPLETED: August 6, 1987

LOCATION: Sarnia (Germain Park)

DRILLING METHOD: Mud Rotary, 5 1/4 inch bit

REFERENCE ELEVATION: 183.29 m AMSL

DRILL SUPERVISOR: J. Markle, D. Belanger



STRATIGRAPHIC AND INSTRUMENTATION LOG

| | |
|---|---|
| PROJECT NAME AND No.: Sarnia, H87-039 | BOREHOLE No.: MSMW-2-87 |
| CLIENT: Ontario Ministry of the Environment | DATE COMPLETED: August 7, 1987 |
| LOCATION: Sarnia (Centennial Park) | DRILLING METHOD: Mud Rotary, 5 1/4 inch bit |
| REFERENCE ELEVATION: 178.24 m AMSL | DRILL SUPERVISOR: J. Markle, D. Belanger |

| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|--|---------------------|--------------------------------|
| 0 | | Fill - cinders, coal & wood chips | | 177.53 m AMSL |
| | | Sand - fine to medium yellow quartz sand - coarsens with depth - abundant pebbles below 167 m AMSL | 174.48 | ≡ 176.67 |
| -10 | | Clay Till - grey clay till | 165.34 | 2 inch diameter PVC piezometer |
| -20 | | | | Geoguard Airlift Pump |
| -30 | | | | |
| -40 | | Clay Till - becomes slightly more sandy | 140.95 | |
| | | | 132.42 | 135.13 |
| | | | 131.33 | 134.53 |
| | | Kettle Point Shale | | 131.63 |
| -50 | | | | |
| -60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME AND No.: Sarnia, H87-039

BOREHOLE No.: MSMW-3-87

CLIENT: Ontario Ministry of the Environment

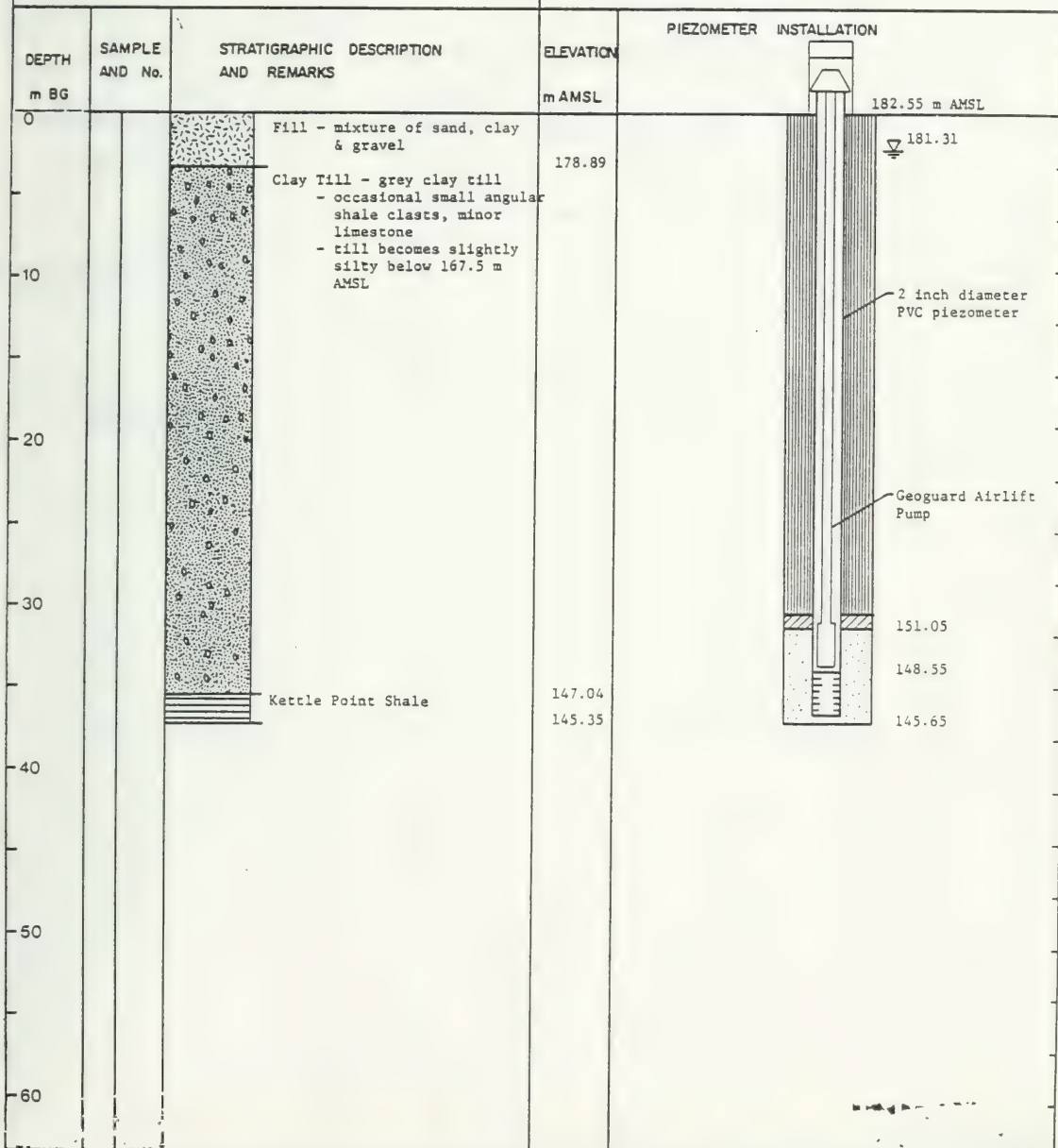
DATE COMPLETED: August 10, 1987

LOCATION: Sarnia (Talfourd St.)

DRILLING METHOD: Mud Rotary, 5 1/4 inch bit

REFERENCE ELEVATION: 183.41 m AMSL

DRILL SUPERVISOR: J. Markle



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STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME AND No.: Sarnia, H87-039

BOREHOLE No.: MSMW-4-87

CLIENT: Ontario Ministry of the Environment


DATE COMPLETED: August 11, 1987

LOCATION: Sarnia (Campbell Street)

DRILLING METHOD: Mud Rotary, 5 1/4 inch bit

REFERENCE ELEVATION: 185.70 m AMSL

DRILL SUPERVISOR: J. Markle

| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|--|---------------------|--|
| 0 | | Clay Till - light brown to buff - weathered | 185.00 |  <p>185.00 m AMSL</p> <p>182.58</p> <p>2 inch diameter PVC piezometer</p> <p>Geoguard Airlift Pump</p> <p>151.40</p> <p>150.80</p> <p>148.00</p> |
| | | Sand - poorly sorted sand with minor gravel | 178.90 | |
| | | | 177.38 | |
| 10 | | Clay Till - grey clay till - minor sand - occasional small angular shale clast - till becomes very soft below 171 m AMSL - clasts become more abundant with depth | | |
| 20 | | | | |
| 30 | | | | |
| 40 | | Kettle Point Shale | 148.12 147.70 | |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME AND No.: Sarnia, H87-039

BOREHOLE No.: MSMW-5-87

CLIENT: Ontario Ministry of the Environment


DATE COMPLETED: August 12, 1987

LOCATION: Sarnia (LaSalle Rd. & Hwy. 40)

DRILLING METHOD: Mud Rotary, 5 1/4 inch bit

REFERENCE ELEVATION: 187.96 m AMSL

DRILL SUPERVISOR: J. Markle

| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|--|---------------------|--|
| 0 | | Clay Till - stiff grey clay till - occasional small angular shale clast | 187.38 |  <p>187.38 m AMSL</p> <p>▽184.15</p> <p>2 inch diameter PVC piezometer</p> <p>Geoguard Air-lift Pump</p> <p>153.58</p> <p>152.68</p> <p>149.78</p> |
| 10 | | Clay Till - soft silty clay till - occasional small angular shale & limestone clast | 175.19 | |
| 20 | | | | |
| 30 | | | | |
| 40 | | Kettle Point Shale | 149.89 149.58 | |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

| | |
|---|---|
| PROJECT NAME AND No.: Sarnia, H87-039 | BOREHOLE No.: MSMW-6-87 |
| CLIENT: Ontario Ministry of the Environment | DATE COMPLETED: August 14, 1987 |
| LOCATION: Sarnia (Guthrie Park) | DRILLING METHOD: Mud Rotary, 5 1/4 inch bit |
| REFERENCE ELEVATION: 181.86 m AMSL | DRILL SUPERVISOR: J. Markle |

| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|---|---------------------|---|
| 0 | | Sand - very fine to fine - light orange to brown - minor silt & clay | 181.11 | <p>181.11 m AMSL</p> <p>▽ 177.05</p> <p>2 inch diameter PVC piezometer</p> <p>Geoguard Airlift Pump</p> <p>151.71</p> <p>150.61</p> <p>147.71</p> |
| | | Clay Till - stiff grey clay till - occasional small angular shale clast | 177.45 | |
| 10 | | | | |
| 20 | | Clay Till - dark grey - minor sand - abundant small angular shale clasts | 171.97 | |
| 30 | | Kettle Point Shale - very weathered & fractured | 148.50 147.41 | |
| 40 | | | | |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME AND No.: Sarnia, H87-039

BOREHOLE No.: MSMW-7-87

CLIENT: Ontario Ministry of the Environment

DATE COMPLETED: August 17, 1987

LOCATION: Sarnia (McGregor Side road)

DRILLING METHOD: Mud Rotary, 5 1/4 inch bit

REFERENCE ELEVATION: 197.35 m AMSL

DRILL SUPERVISOR: J. Markle

| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|--|---------------------|--------------------------------|
| 0 | | Clay Till - weathered light brown to buff - minor sand | | 196.72 m AMSL |
| 10 | | Clay Till - light grey clay till - stiff - few clasts | 192.76 | ▽ 188.59 |
| 20 | | Clay Till - light grey clay till - becoming soft & pliable - occasional small angular shale & limestone clasts | 178.43 | 2 inch diameter PVC piezometer |
| 30 | | | | Geoguard Airlift Pump |
| 40 | | | | 157.42 156.62 |
| 50 | | Kettle Point Shale - very hard shale - no weathered surface or fractures | 154.35 153.42 | 153.72 |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

| | |
|---|---|
| PROJECT NAME AND No.: Sarnia, H87-039 | BOREHOLE No.: MSMW-8-87 |
| CLIENT: Ontario Ministry of the Environment | DATE COMPLETED: August 18, 1987 |
| LOCATION: Sarnia (LaSalle Rd.) | DRILLING METHOD: Mud Rotary, 5 1/4 inch bit |
| REFERENCE ELEVATION: 190.26 m AMSL | DRILL SUPERVISOR: J. Markle |


| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|--|---------------------|---|
| 0 | | Clay Till - brown to buff weathered clay till - minor sand | 189.51 | <p>189.51 m AMSL</p> <p>▽ 186.29</p> <p>2 inch diameter PVC piezometer</p> <p>Geoguard Airlift Pump</p> <p>157.21</p> <p>155.41</p> <p>152.51</p> |
| | | Clay Till - grey clay till - stiff - occasional small angular clasts | 183.40 | |
| 10 | | Clay Till - dark grey clay till - slightly softer - clasts becoming more abundant with depth | 178.84 | |
| 20 | | | | |
| 30 | | | | |
| 40 | | Kettle Point Shale | 153.09 152.31 | |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

| | |
|---|---|
| PROJECT NAME AND No.: Sarnia, H87-039 | BOREHOLE No.: MSMW-10-87 |
| CLIENT: Ontario Ministry of the Environment | DATE COMPLETED: August 20, 1987 |
| LOCATION: Sarnia (Air Products) | DRILLING METHOD: Mud Rotary, 5 1/4 inch bit |
| REFERENCE ELEVATION: 192.77 m AMSL | DRILL SUPERVISOR: J. Markle |

| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|---|---------------------|-----------------------------------|
| 0 | | Clay Till - light brown weathered clay till - minor fine sand | 191.88 | 191.88 m AMSL |
| 10 | | Clay Till - grey clay till - abundant small angular shale clasts | 185.78 | ▽ 186.94 |
| 20 | | Clay Till - dark grey clay till - abundant small angular shale & limestone clasts - increasing sand content with depth | 172.07 | 2 inch diameter PVC piezometer |
| 30 | | | | Geoguard Airlift Pump |
| 40 | | Kettle Point Shale | 155.00 153.98 | 158.78 157.18 154.28 |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

| PROJECT NAME AND No.: Sarnia, H87-039 | | | BOREHOLE No.: MSMW-9-87 | |
|---|-------------------|---|---|--|
| CLIENT: Ontario Ministry of the Environment | | | DATE COMPLETED: August 19, 1987 | |
| LOCATION: Sarnia (Churchill Rd.) | | | DRILLING METHOD: Mud Rotary, 5 1/4 inch bit | |
| REFERENCE ELEVATION: 191.58 m AMSL | | | DRILL SUPERVISOR: J. Markle | |
| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
| 0 | | Clay Till - light brown to grey becoming light grey below 184 m AMSL - soft & plastic below 184 m AMSL | 190.66 |  <p>190.66 m AMSL</p> <p>▽ 187.14</p> <p>2 inch diameter PVC piezometer</p> <p>Geoguard Airlift Pump</p> <p>158.36</p> <p>156.56</p> <p>153.36</p> |
| 10 | | Clay Till - dary grey clay till - abundant shale clasts | 179.99 | |
| 20 | | - slightly sandy below 170 m AMSL | | |
| 30 | | | | |
| 40 | | Kettle Point Shale - weathered & fractured surface | 154.08 153.36 | |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME AND No.: Sarnia, H87-039

BOREHOLE No.: MSMW-11-87

CLIENT: Ontario Ministry of the Environment

DATE COMPLETED: August 25, 1987

LOCATION: Sarnia (Polymer Rd.)


DRILLING METHOD: Mud Rotary, 5 1/4 inch bit

REFERENCE ELEVATION: 182.19 m AMSL

DRILL SUPERVISOR: J. Markle

| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|---|---------------------|---|
| 0 | | Clay Till - light brown to grey weathered clay till | 181.49 | <p>181.49 m AMSL</p> <p>177.12</p> <p>2 inch diameter PVC piezometer</p> <p>Geoguard Airlift Pump</p> <p>151.89</p> <p>151.69</p> <p>148.79</p> |
| 10 | | Clay Till - grey clay till - becomes soft & more plastic below 168 m AMSL - abundant small angular shale clasts | 176.31 | |
| 20 | | | | |
| 30 | | Kettle Point Shale - weathered & fractured surface | 148.42 147.99 | |
| 40 | | | | |
| 50 | | | | |
| 60 | | | | |
| 70 | | | | |
| 80 | | | | |
| 90 | | | | |
| 100 | | | | |
| 110 | | | | |
| 120 | | | | |
| 130 | | | | |
| 140 | | | | |
| 150 | | | | |
| 160 | | | | |
| 170 | | | | |
| 180 | | | | |
| 190 | | | | |
| 200 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

| PROJECT NAME AND No.: Sarnia, H87-039 | | | BOREHOLE No.: MSMW-12-87 | |
|---|-------------------|--|--|--|
| CLIENT: Ontario Ministry of the Environment | | | DATE COMPLETED: September 3, 1987 | |
| LOCATION: Sarnia, Ontario (Polysar) | | | DRILLING METHOD: Mud Rotary, 5½ inch bit | |
| REFERENCE ELEVATION: 183.12 m AMSL | | | DRILL SUPERVISOR: J. Markle, D. Belanger | |
| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
| 0 | | Fill - bricks & gravel fill | 180.07 |  <p>183.12 m AMSL</p> <p>172.13</p> <p>2 inch diameter PVC piezometer</p> <p>Geoguard Air-lift Pump</p> <p>119.70</p> <p>118.90</p> <p>114.69</p> <p>111.80</p> |
| | | Clay Till - weathered light brown to buff | 177.02 | |
| 10 | | Clay Till - grey clay till - stiff to firm - trace fine to coarse sand & gravel | | |
| 20 | | | | |
| 30 | | | | |
| 40 | | Clay Till - grey clay till - soft - trace - fine to coarse sand & gravel | 145.02 | |
| 50 | | Sandy Clay Till - dark grey - variable sandy gravel till to silty till - dense - abundant boulders | 135.27 | |
| 60 | | | | |
| 70 | | Hamilton Limestone | 112.41 111.52 | |
| 80 | | | | |
| 90 | | | | |
| 100 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME AND No.: Sarnia, H87-039

BOREHOLE No.: MSMW-13-87

CLIENT: Ontario Ministry of the Environment

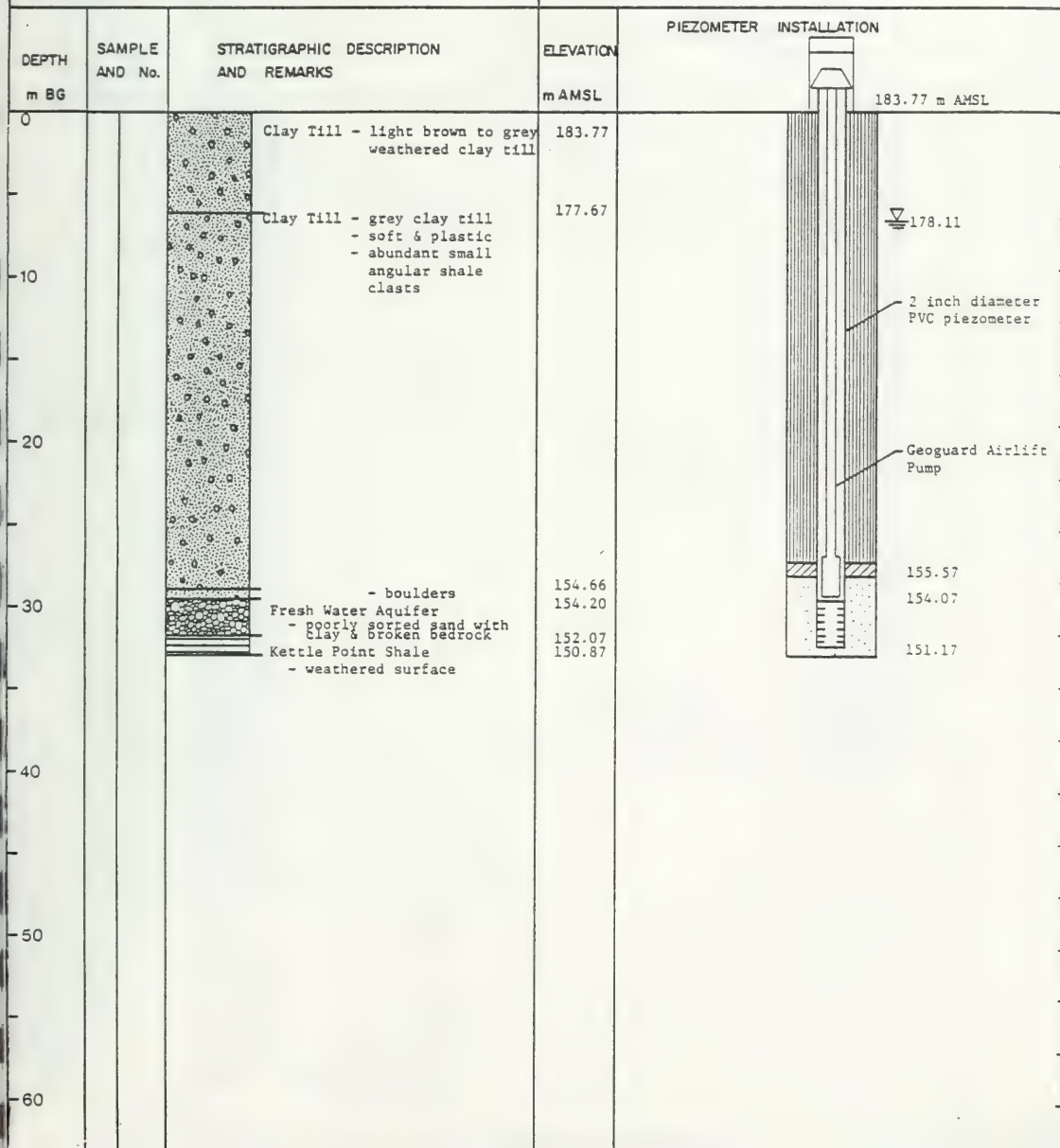
DATE COMPLETED: September 10, 1987

LOCATION: Sarnia (Suncor)

DRILLING METHOD: Mud Rotary, 5 1/4 inch bit


REFERENCE ELEVATION: 184.66 m AMSL

DRILL SUPERVISOR: J. Markle



STRATIGRAPHIC AND INSTRUMENTATION LOG

| | |
|---|---|
| PROJECT NAME AND No.: Sarnia, H87-039 | BOREHOLE No.: MSMW-14-87 |
| CLIENT: Ontario Ministry of the Environment | DATE COMPLETED: September 4, 1987 |
| LOCATION: Sarnia (DOW Brine) | DRILLING METHOD: Mud Rotary, 5 1/4 inch bit |
| REFERENCE ELEVATION: 192.32 m AMSL | DRILL SUPERVISOR: J. Markle |

| DEPTH m BG | SAMPLE AND No. | STRATIGRAPHIC DESCRIPTION AND REMARKS | ELEVATION m AMSL | PIEZOMETER INSTALLATION |
|---------------|-------------------|--|---------------------|--|
| 0 | | Clay Till - brown to buff weathered clay till | 191.61 |  <p>191.61 m AMSL</p> <p>184.66</p> <p>2 inch diameter PVC piezometer</p> <p>Geoguard Airlift Pump</p> <p>155.41</p> <p>155.11</p> <p>152.21</p> |
| | | Clay Till - grey clay till - stiff - occasional small angular shale clasts | 187.04 | |
| 10 | | | | |
| 20 | | Clay Till - dark grey clay till - soft & plastic - occasional small angular shale & limestone clasts | 171.80 | |
| 30 | | | | |
| | | - abundant angular clasts & boulders | 155.64 | |
| | | Fresh Water Aquifer - poorly sorted sand & gravel | 151.99 | |
| 40 | | Kettle Point Shale | 151.68 151.07 | |
| 50 | | | | |
| 60 | | | | |

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME AND No.: Sarnia, H87-039

BOREHOLE No.: MSMW-15-87

CLIENT: Ontario Ministry of the Environment

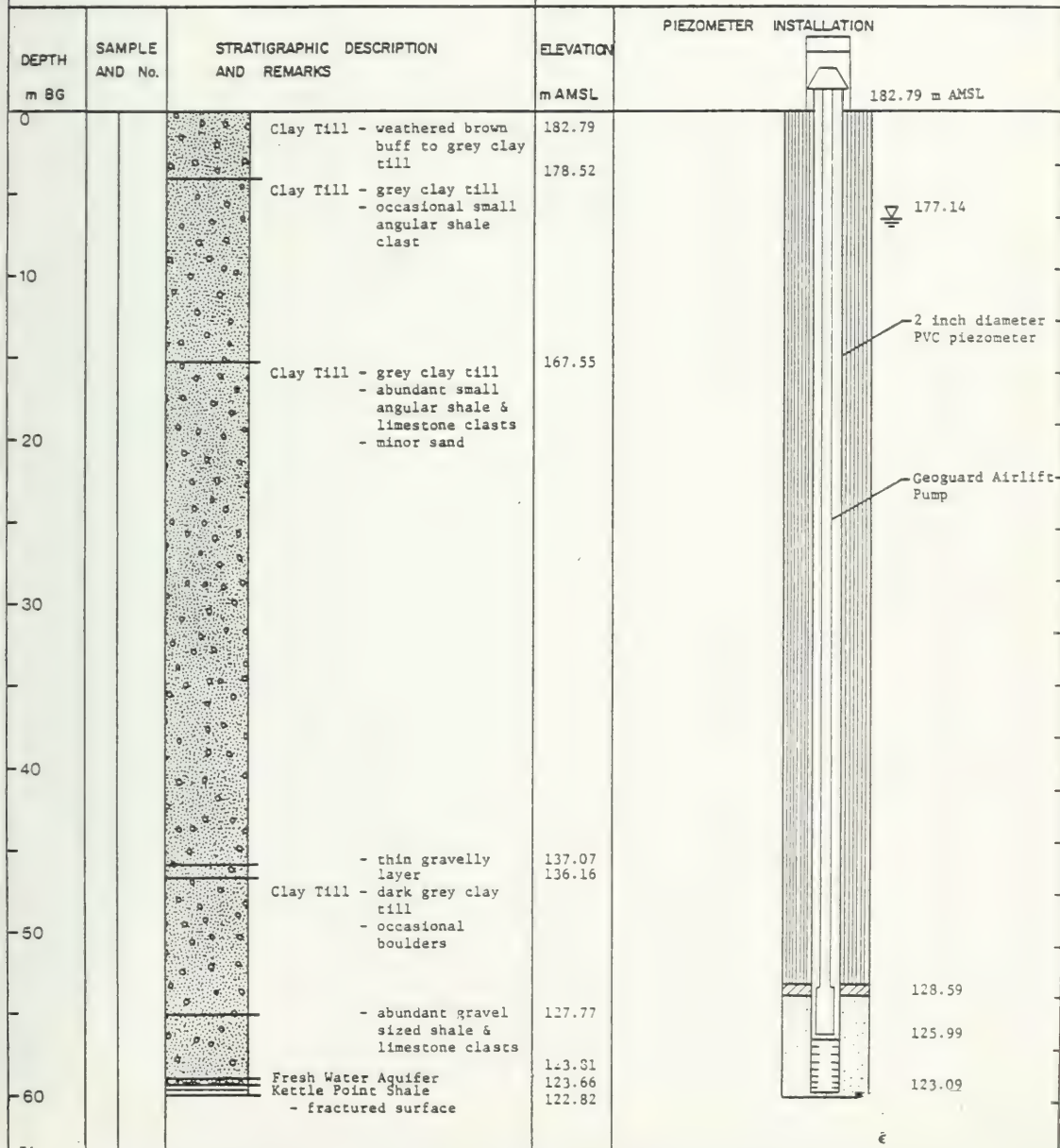
DATE COMPLETED: September 9, 1987

LOCATION: Sarnia (DOW)

DRILLING METHOD: Mud Rotary, 5 1/4 inch bit

REFERENCE ELEVATION: 183.69 m AMSL

DRILL SUPERVISOR: J. Markle



APPENDIX E

Hydraulic Test Results of
Fresh Water Aquifer

APPENDIX E1

Slug Tests
87-Series Wells

Fresh Water Aquifer

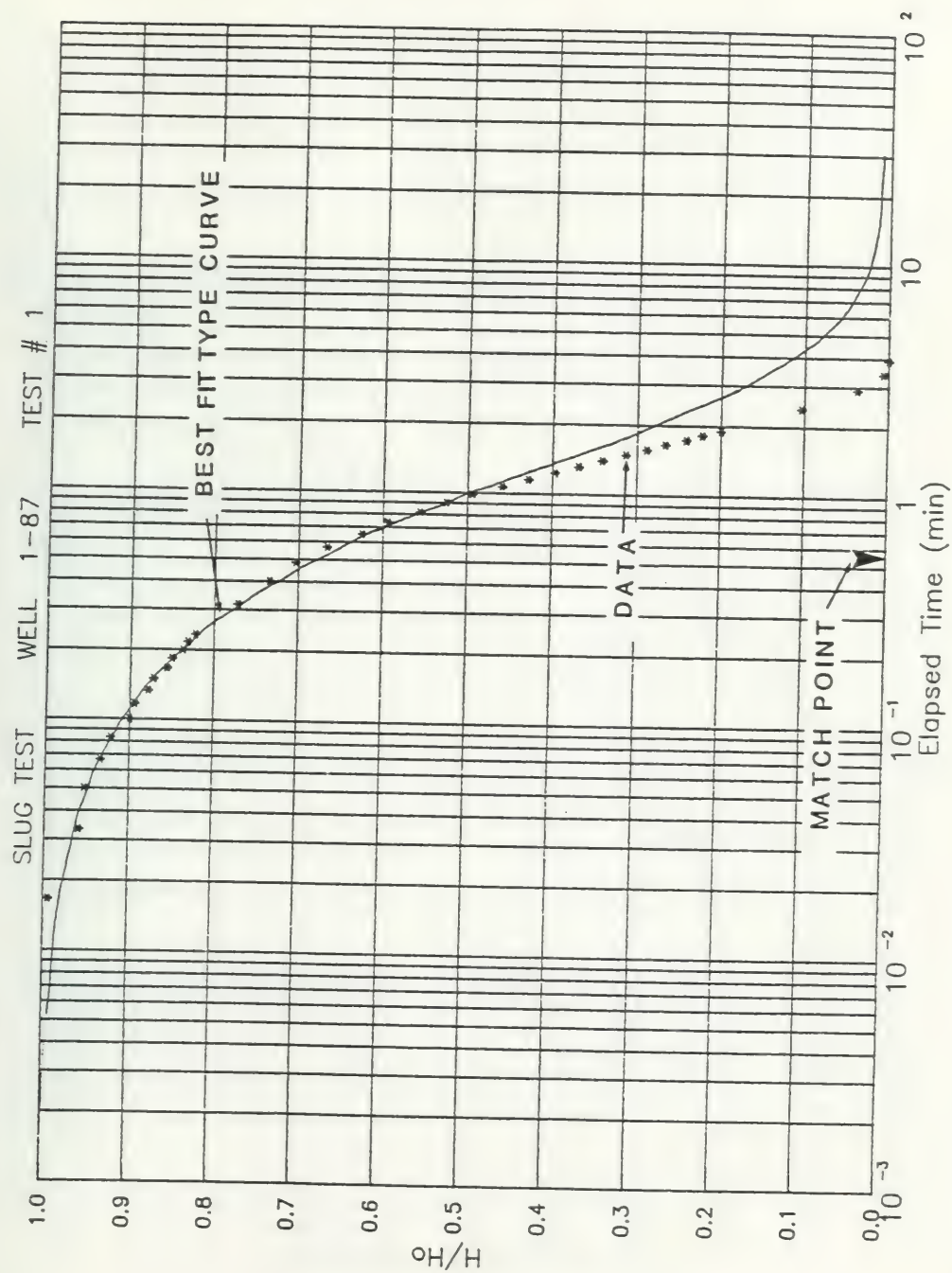
Summary Table and Type Curve Analyses

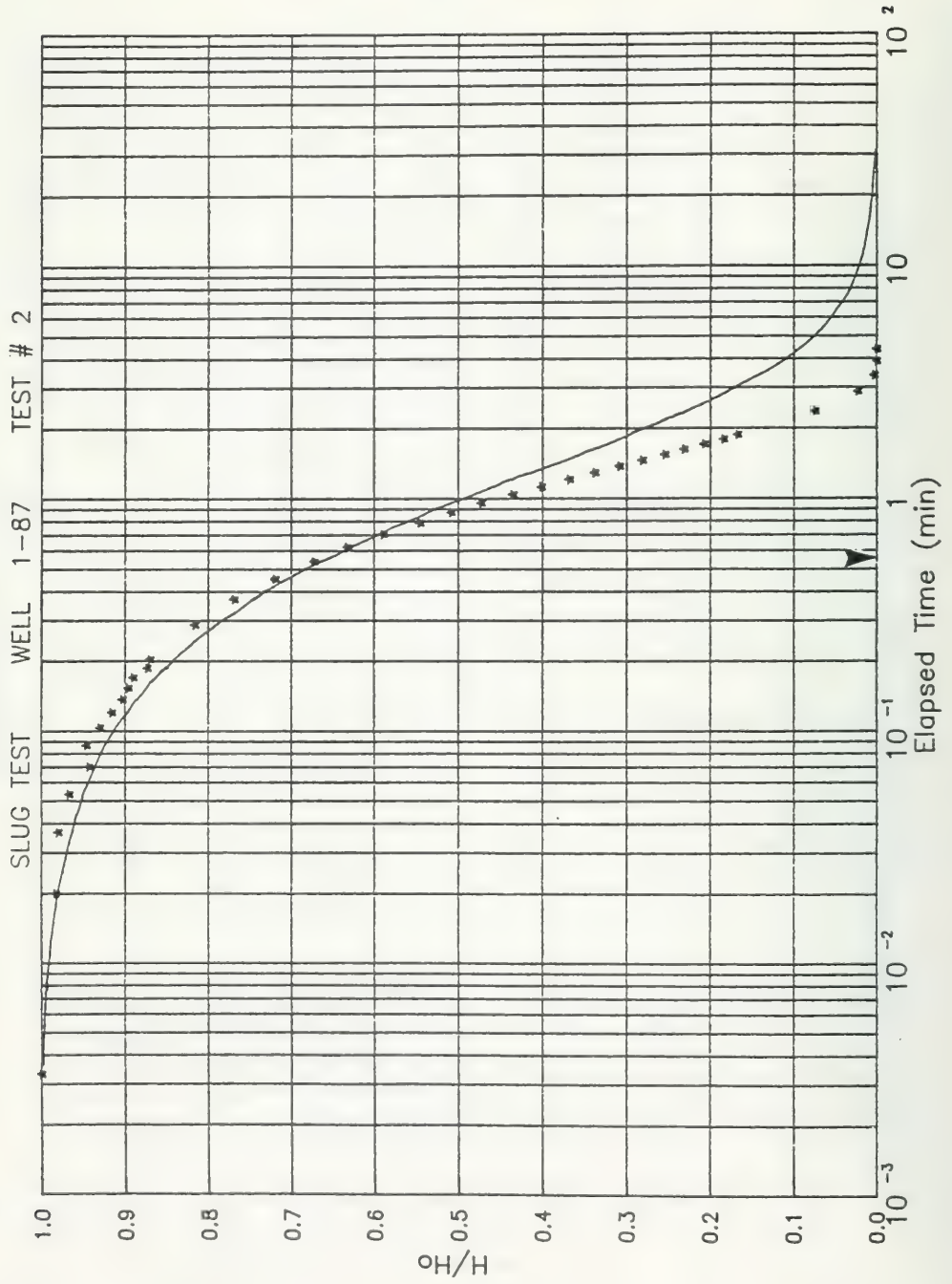
SUMMARY OF SLUG TESTS
FRESH WATER AQUIFER

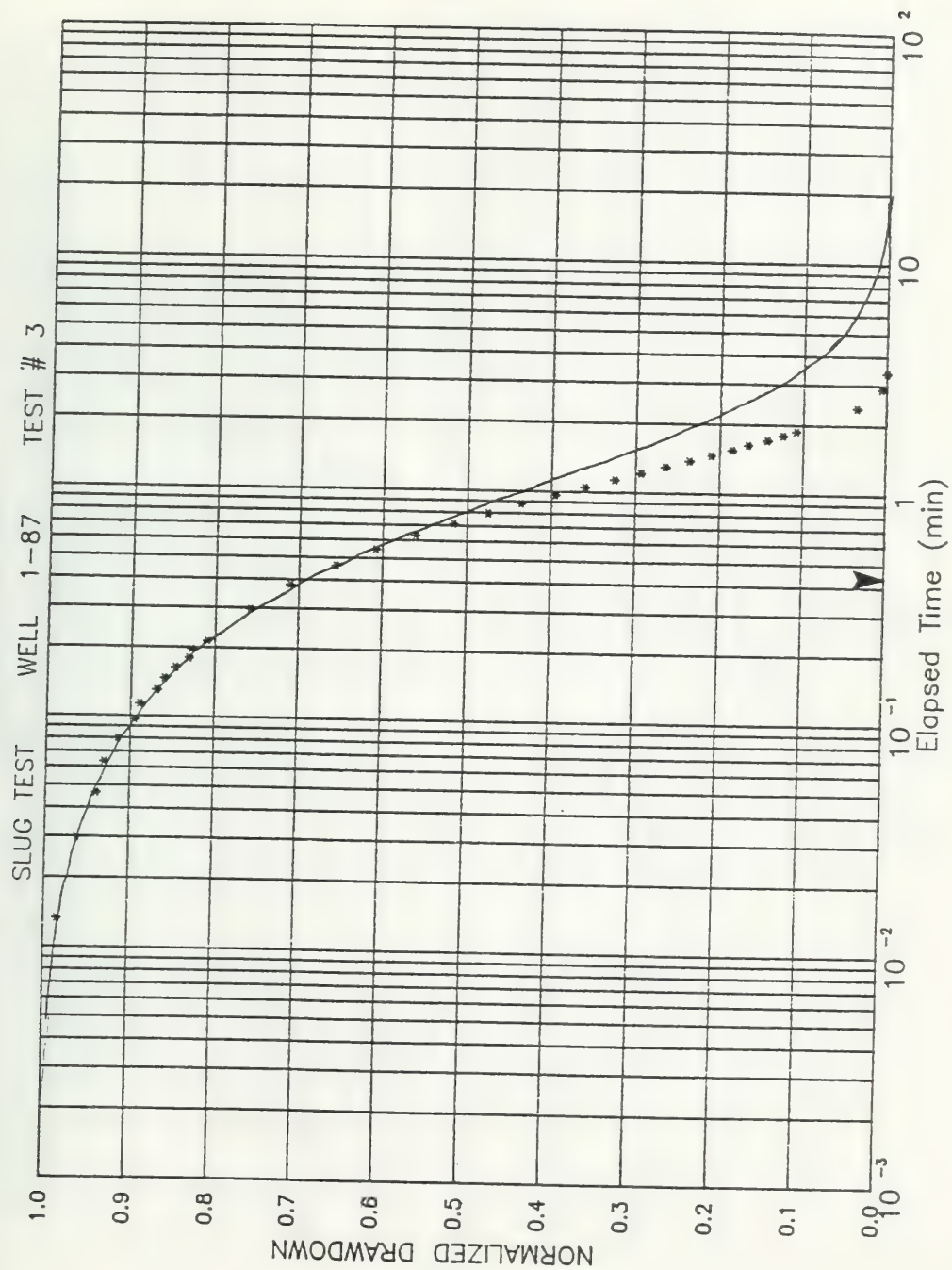
| Well # | Test # | Match point parameters | | | Calculated parameters | | Comments |
|--------|--------|------------------------|---------|---------|--------------------------|--------------------------------|----------|
| | | Beta | t (sec) | Alpha | *Transmissivity (m**2/s) | **Hydraulic Conductivity (m/s) | |
| 1-87 | 1 | 1.0 | 34.20 | 1.0E-04 | 1.9E-05 | 9.4E-06 | |
| | 2 | 1.0 | 34.20 | 1.0E-04 | 1.9E-05 | 9.4E-06 | |
| | 3 | 1.0 | 26.40 | 1.0E-04 | 2.4E-05 | 1.2E-05 | |
| | 4 | 1.0 | 28.80 | 1.0E-04 | 2.2E-05 | 1.1E-05 | |
| 2-87 | 1 | 1.0 | 17.40 | 1.0E-06 | 3.7E-05 | 1.9E-05 | |
| | 2 | 1.0 | 19.20 | 1.0E-06 | 3.4E-05 | 1.7E-05 | |
| | 3 | 1.0 | 18.00 | 1.0E-05 | 3.6E-05 | 1.8E-05 | |
| 3-87 | 1 | 1.0 | NA | NA | NA | NA | NA Gas |
| 4-87 | 1 | 1.0 | 1.80 | 1.0E-06 | 3.6E-04 | 1.8E-04 | |
| | 2 | 1.0 | 1.68 | 1.0E-06 | 3.8E-04 | 1.9E-04 | |
| | 3 | 1.0 | 1.38 | 1.0E-06 | 4.7E-04 | 2.3E-04 | |
| 5-87 | 1 | 1.0 | 26.40 | 1.0E-03 | 2.4E-05 | 1.2E-05 | Gas |
| | 2 | 1.0 | 16.80 | 1.0E-04 | 3.8E-05 | 1.9E-05 | |
| | 3 | 1.0 | 15.00 | 1.0E-04 | 4.3E-05 | 2.2E-05 | |
| | 4 | 1.0 | 11.40 | 1.0E-04 | 5.7E-05 | 2.8E-05 | |
| 6-87 | 1 | 1.0 | 13.80 | 1.0E-04 | 4.7E-05 | 2.3E-05 | |
| | 2 | 1.0 | 13.80 | 1.0E-04 | 4.7E-05 | 2.3E-05 | |
| | 3 | 1.0 | 14.40 | 1.0E-04 | 4.5E-05 | 2.2E-05 | |
| | 4 | 1.0 | 17.40 | 1.0E-03 | 3.7E-05 | 1.9E-05 | |
| 7-87 | 1 | 1.0 | NA | NA | NA | NA | NA |
| 8-87 | 1 | 1.0 | 56.40 | 1.0E-01 | 1.1E-05 | 5.7E-06 | |
| | 2 | 1.0 | NA | NA | NA | NA | NA Gas |
| | 3 | 1.0 | NA | NA | NA | NA | NA Gas |
| 9-87 | 1 | 1.0 | 198.00 | 1.0E-02 | 3.3E-06 | 1.6E-06 | |
| 10-87 | 1 | 1.0 | 18.00 | 1.0E-07 | 3.6E-05 | 1.8E-05 | |
| | 2 | 1.0 | 9.00 | 1.0E-08 | 7.2E-05 | 3.6E-05 | |
| | 3 | 1.0 | 9.00 | 1.0E-08 | 7.2E-05 | 3.6E-05 | |
| | 4 | 1.0 | 8.40 | 1.0E-08 | 7.7E-05 | 3.8E-05 | |
| 11-87 | 1 | 1.0 | 21.60 | 1.0E-05 | 3.0E-05 | 1.5E-05 | |
| | 2 | 1.0 | 22.20 | 1.0E-05 | 2.9E-05 | 1.5E-05 | |
| | 3 | 1.0 | 19.80 | 1.0E-05 | 3.3E-05 | 1.6E-05 | |
| | 4 | 1.0 | 20.40 | 1.0E-05 | 3.2E-05 | 1.6E-05 | |
| 12-87 | 1 | 1.0 | NA | NA | NA | NA | NA |
| 13-87 | 1 | 1.0 | 5.34 | 1.0E-05 | 1.2E-04 | 6.0E-05 | |
| | 2 | 1.0 | 4.68 | 1.0E-05 | 1.4E-04 | 6.9E-05 | |
| | 3 | 1.0 | 4.56 | 1.0E-05 | 1.4E-04 | 7.1E-05 | |
| | 4 | 1.0 | 4.38 | 1.0E-05 | 1.5E-04 | 7.4E-05 | |
| 14-87 | 1 | 1.0 | 22.20 | 1.0E-03 | 2.9E-05 | 1.5E-05 | |
| | 2 | 1.0 | 16.20 | 1.0E-05 | 4.0E-05 | 2.0E-05 | |
| | 3 | 1.0 | 16.80 | 1.0E-05 | 3.8E-05 | 1.9E-05 | |
| | 4 | 1.0 | 15.00 | 1.0E-05 | 4.3E-05 | 2.2E-05 | |
| 15-87 | 1 | 1.0 | 10.80 | 1.0E-04 | 6.0E-05 | 3.0E-05 | |
| | 2 | 1.0 | 10.20 | 1.0E-04 | 6.3E-05 | 3.2E-05 | |
| | 3 | 1.0 | 10.80 | 1.0E-04 | 6.0E-05 | 3.0E-05 | |
| | 4 | 1.0 | 10.20 | 1.0E-04 | 6.3E-05 | 3.2E-05 | |

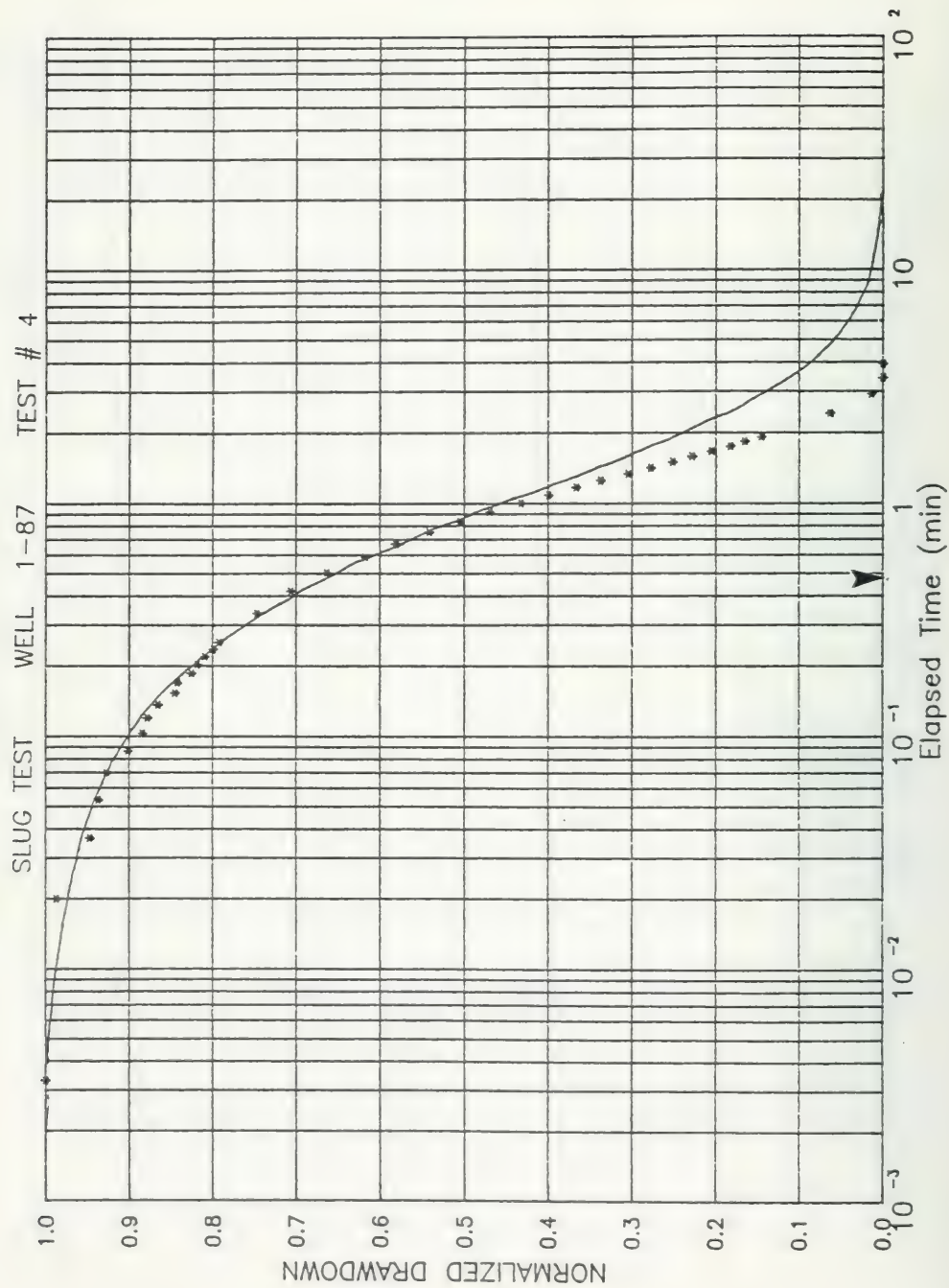
* Determined from $T = \text{Beta} * rc^{*2} / t$
where $rc = 0.025$ m.

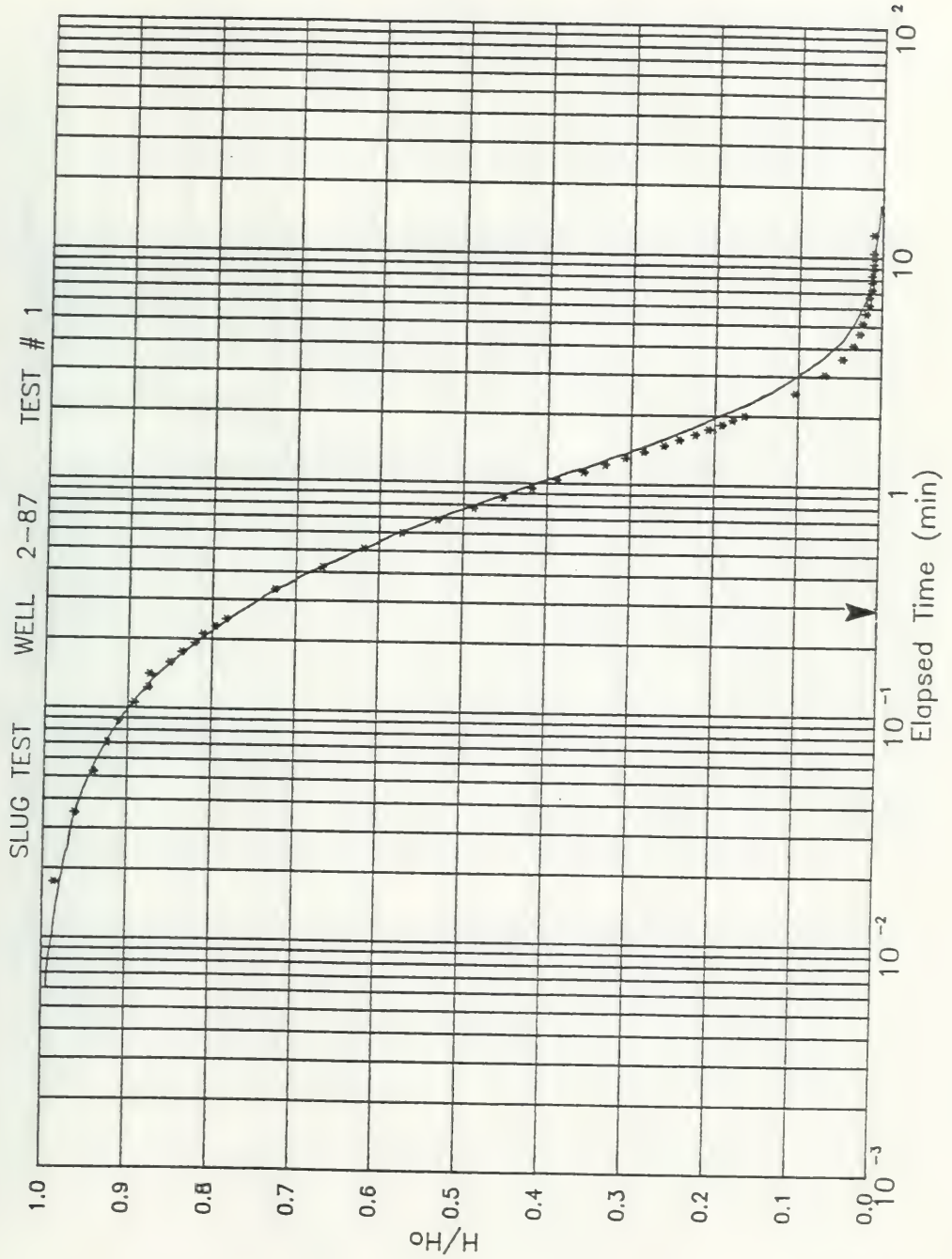
** Determined assuming formation thickness of 2 m.

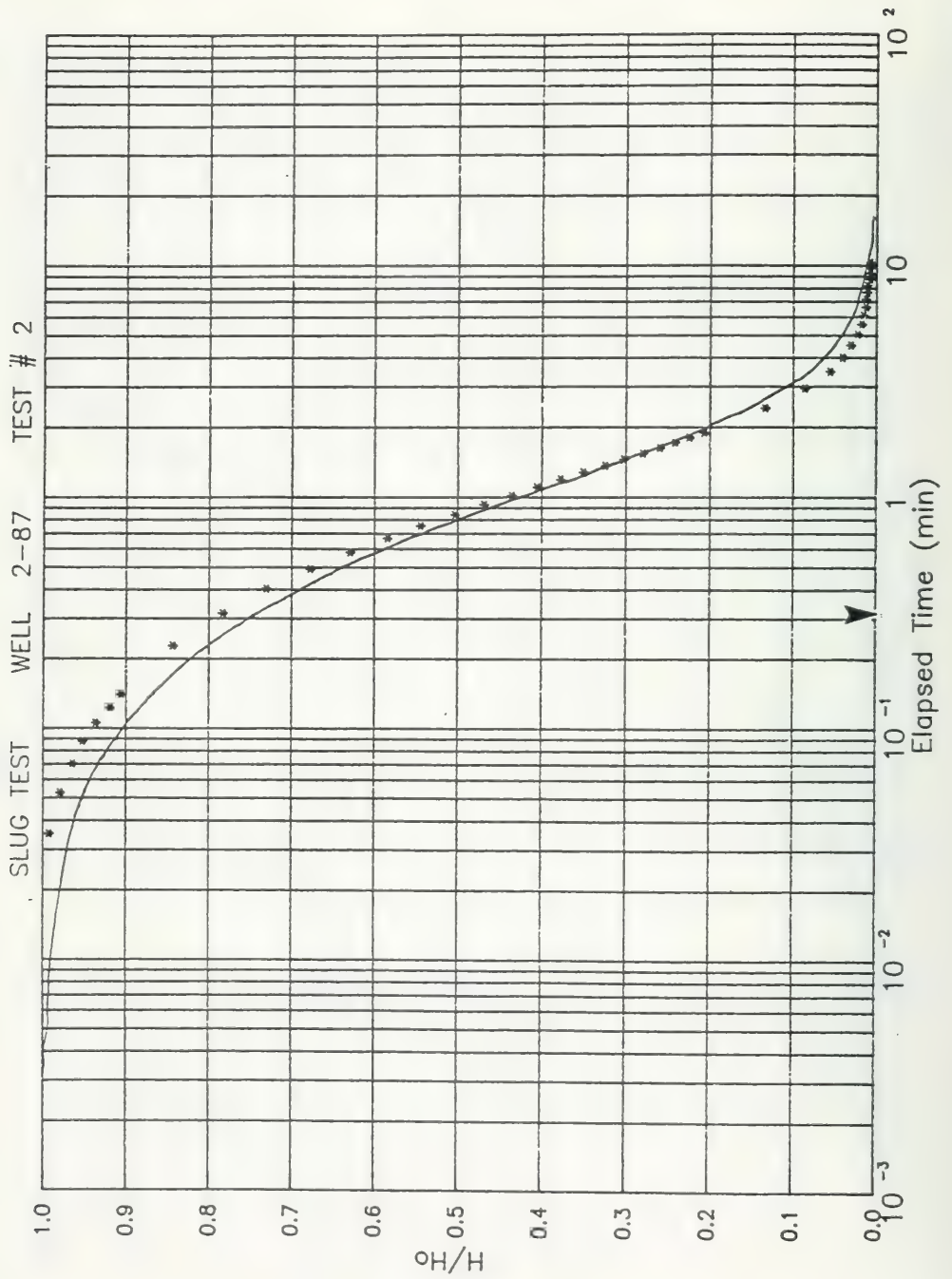




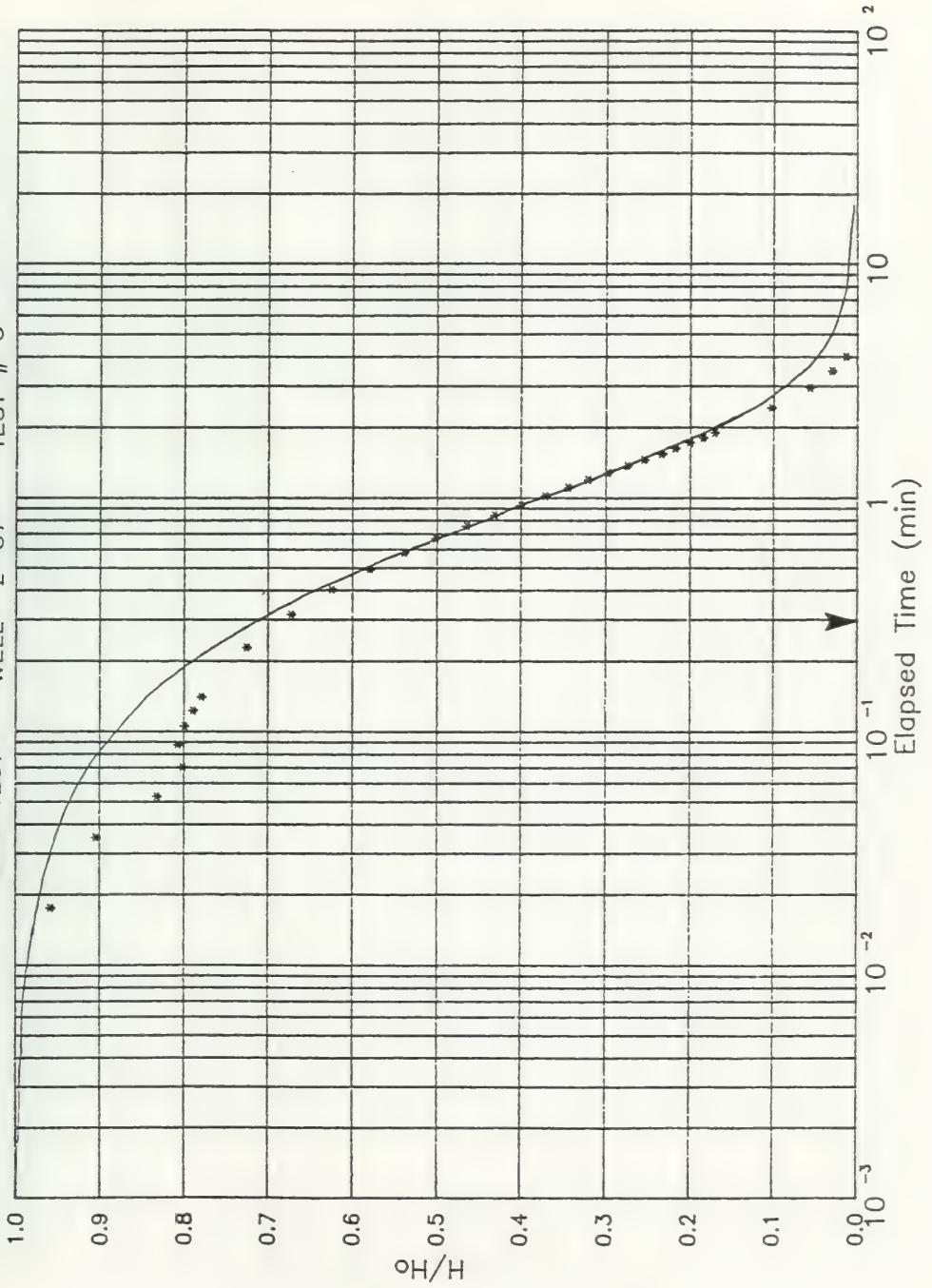


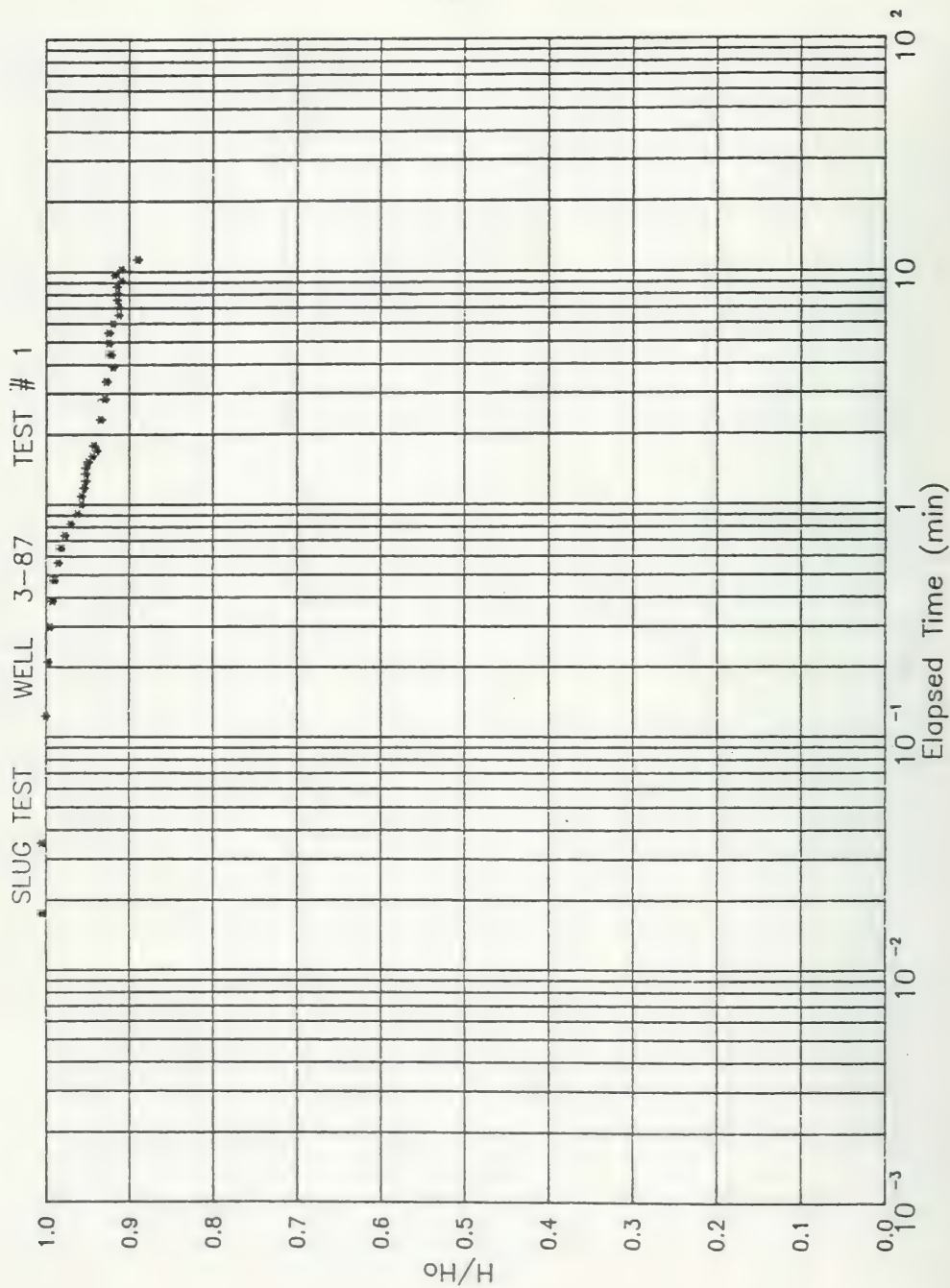


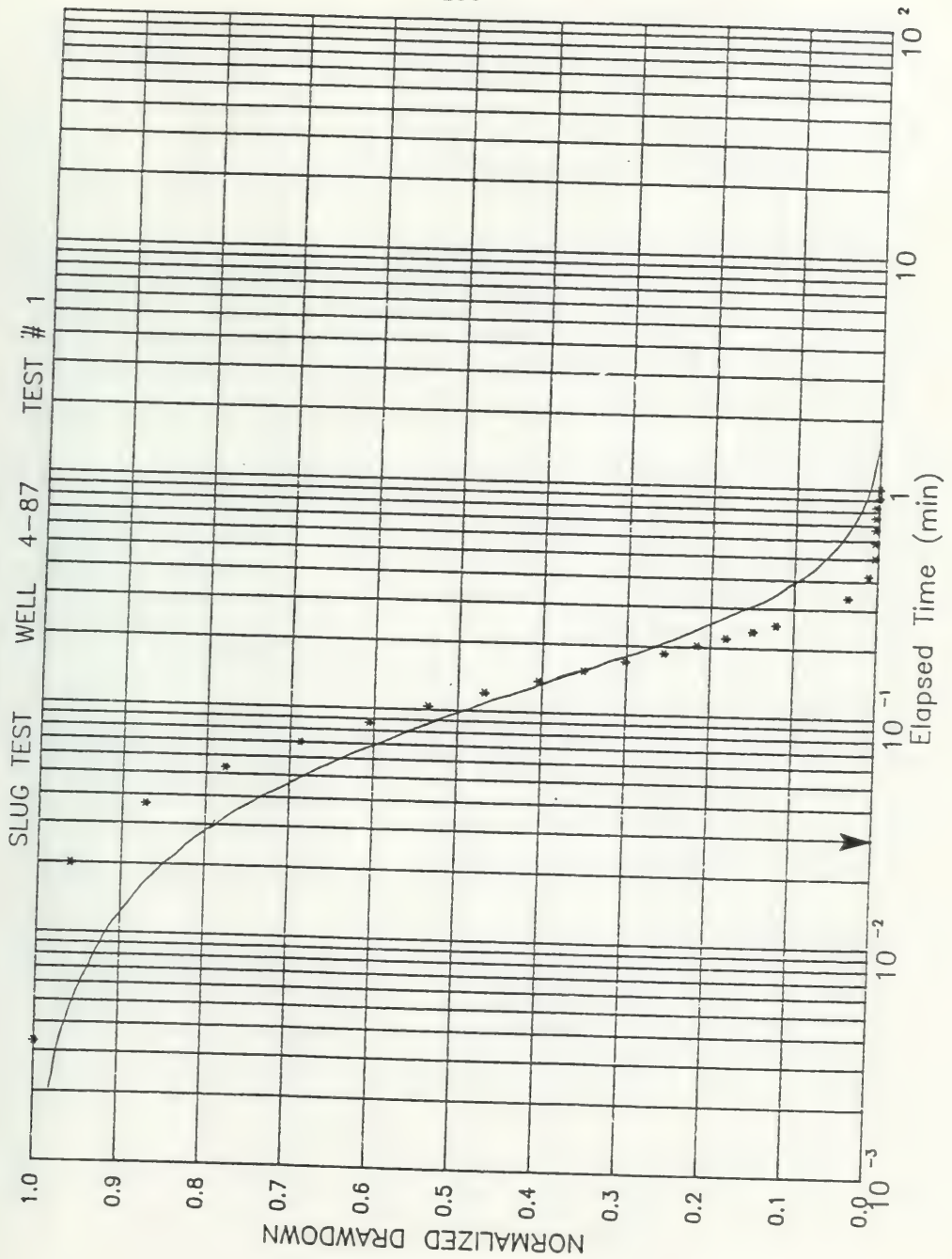




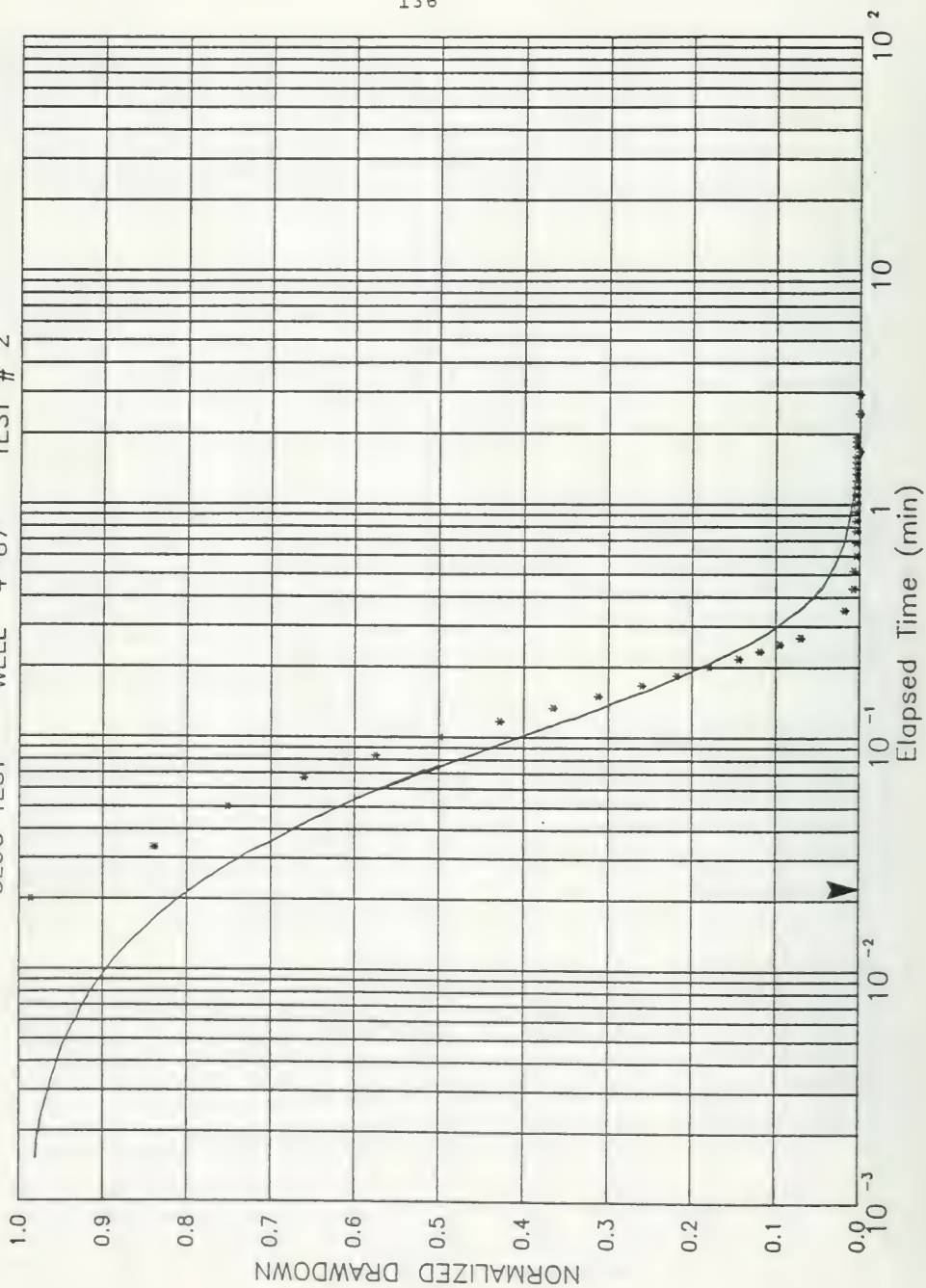
SLUG TEST WELL 2-87 TEST # 3

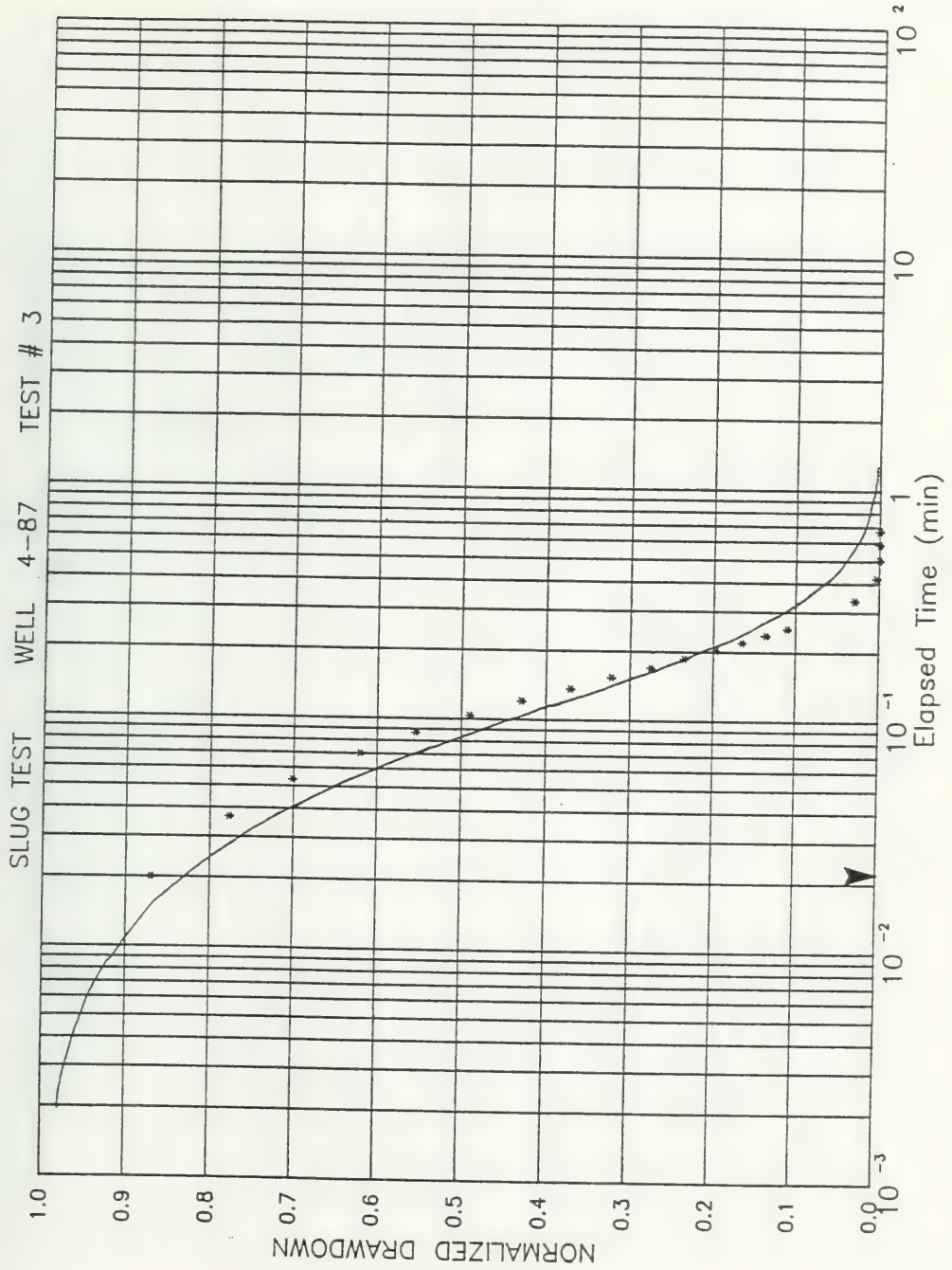


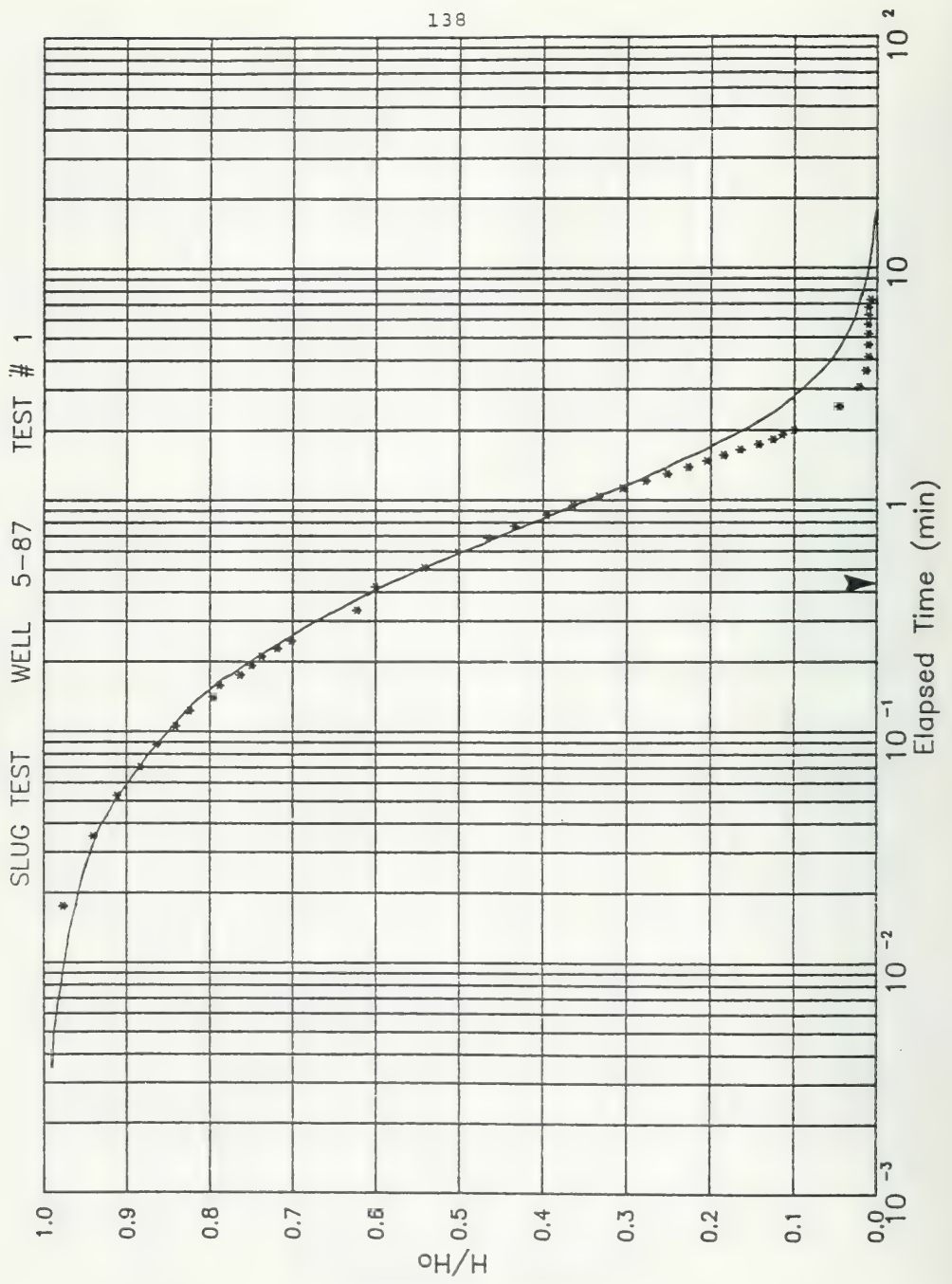


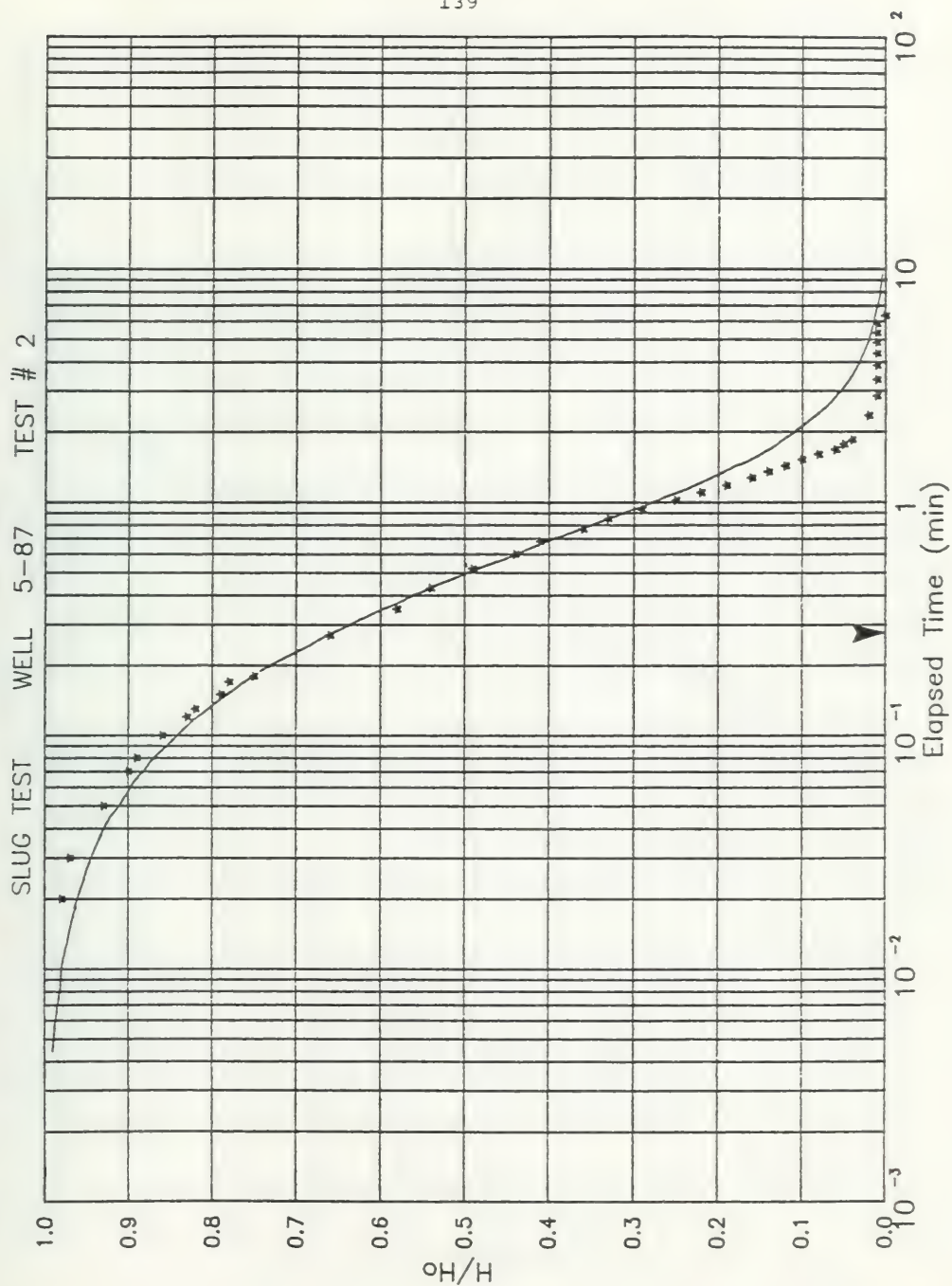


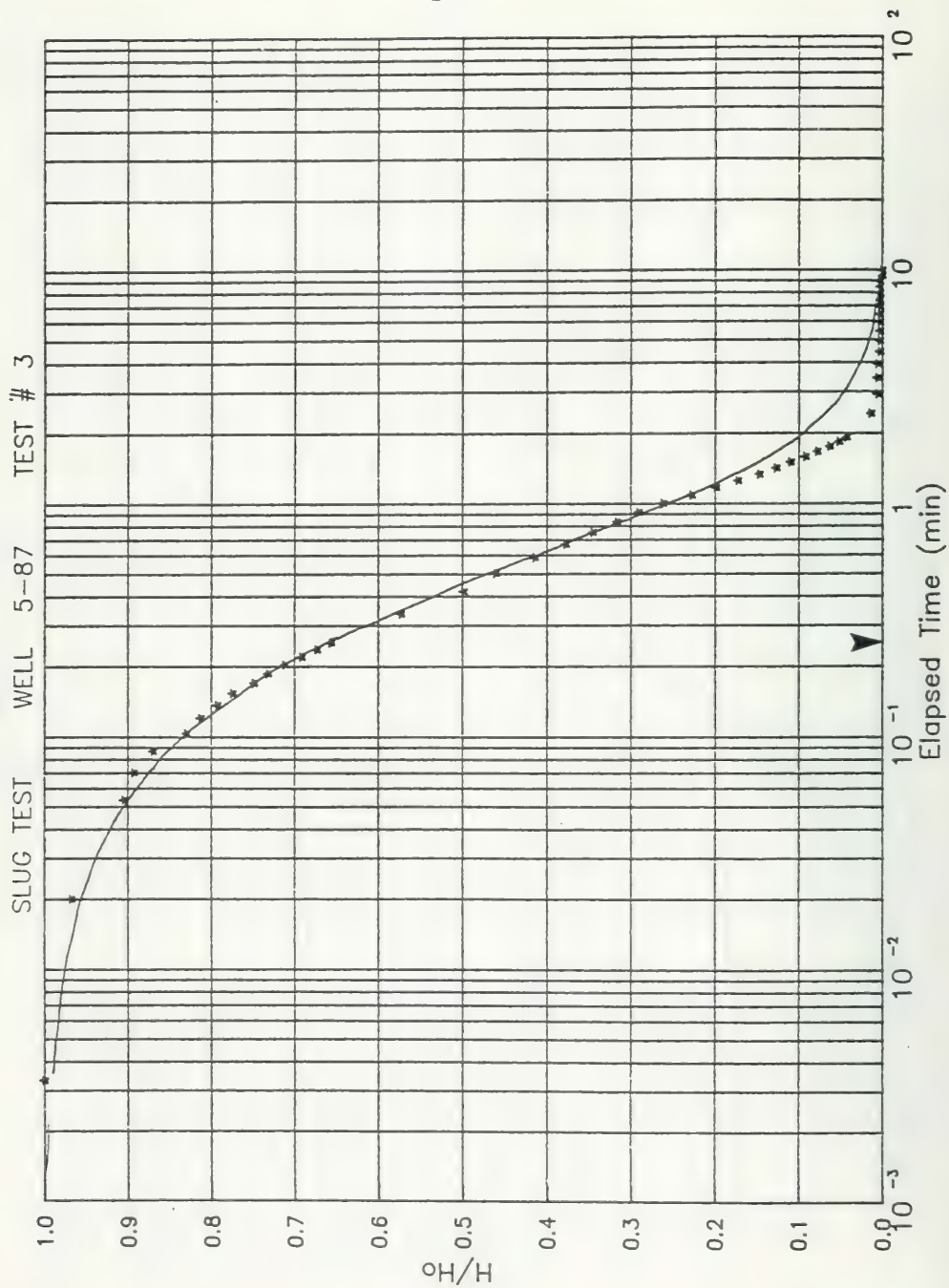
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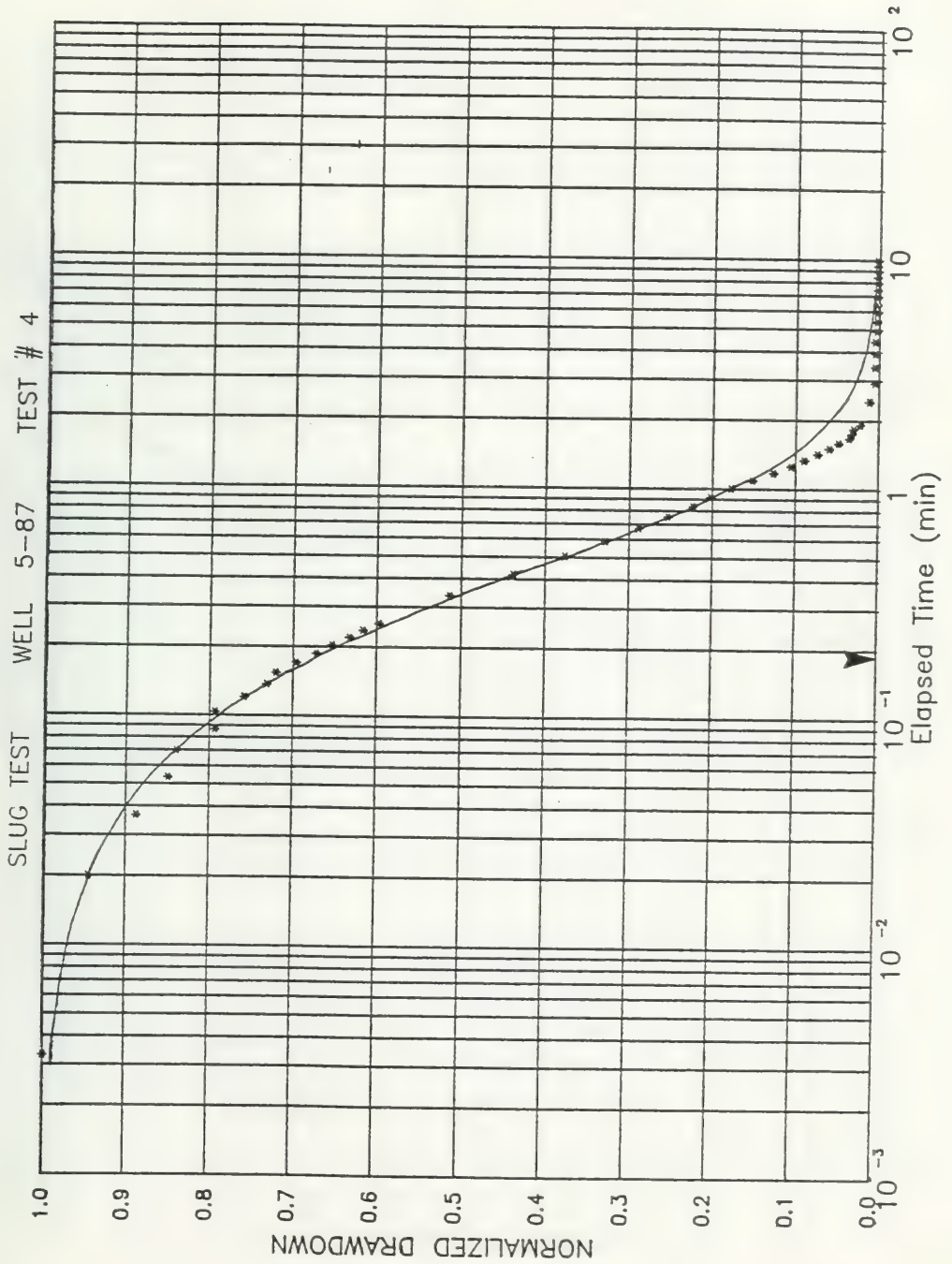


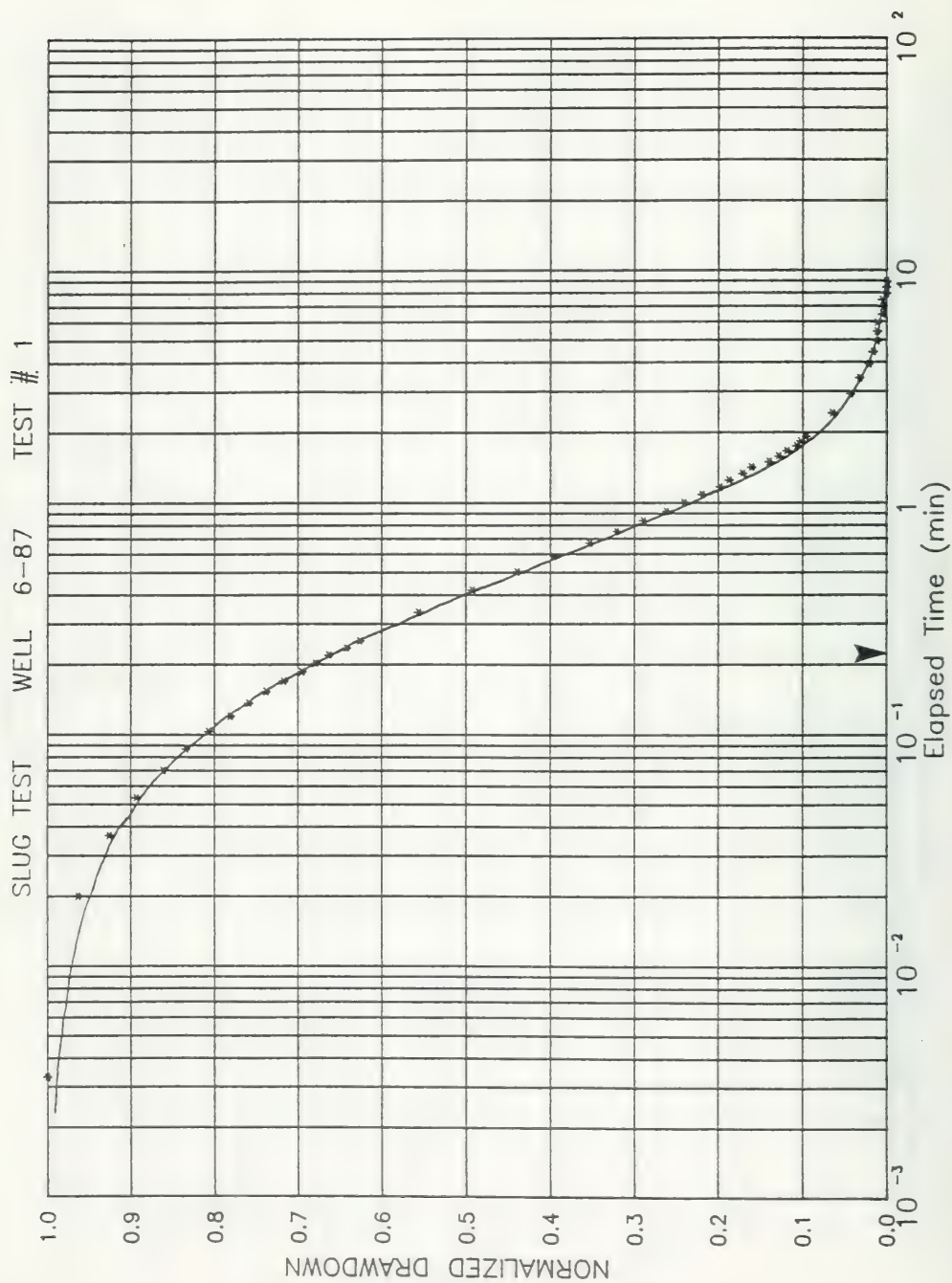


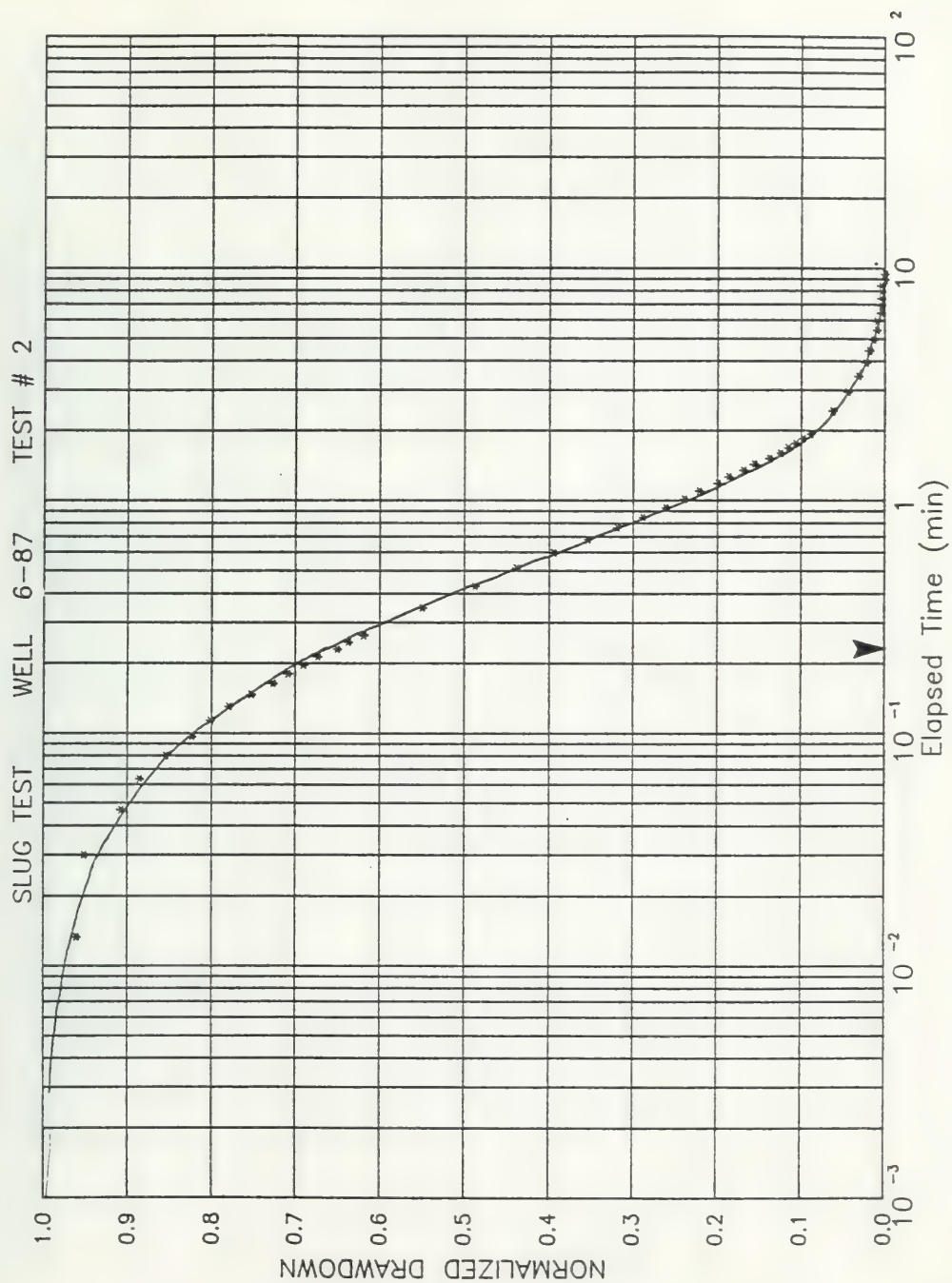


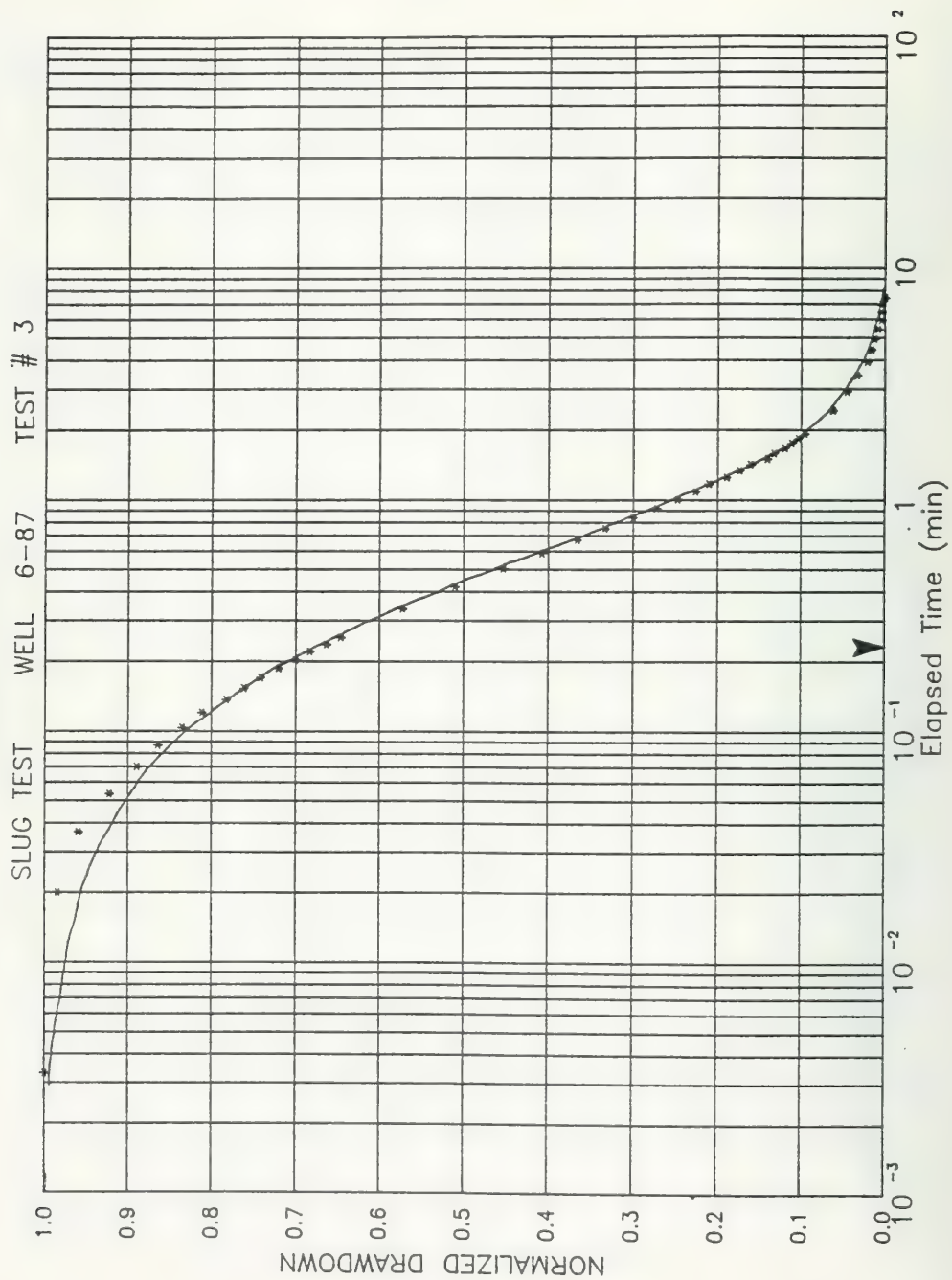


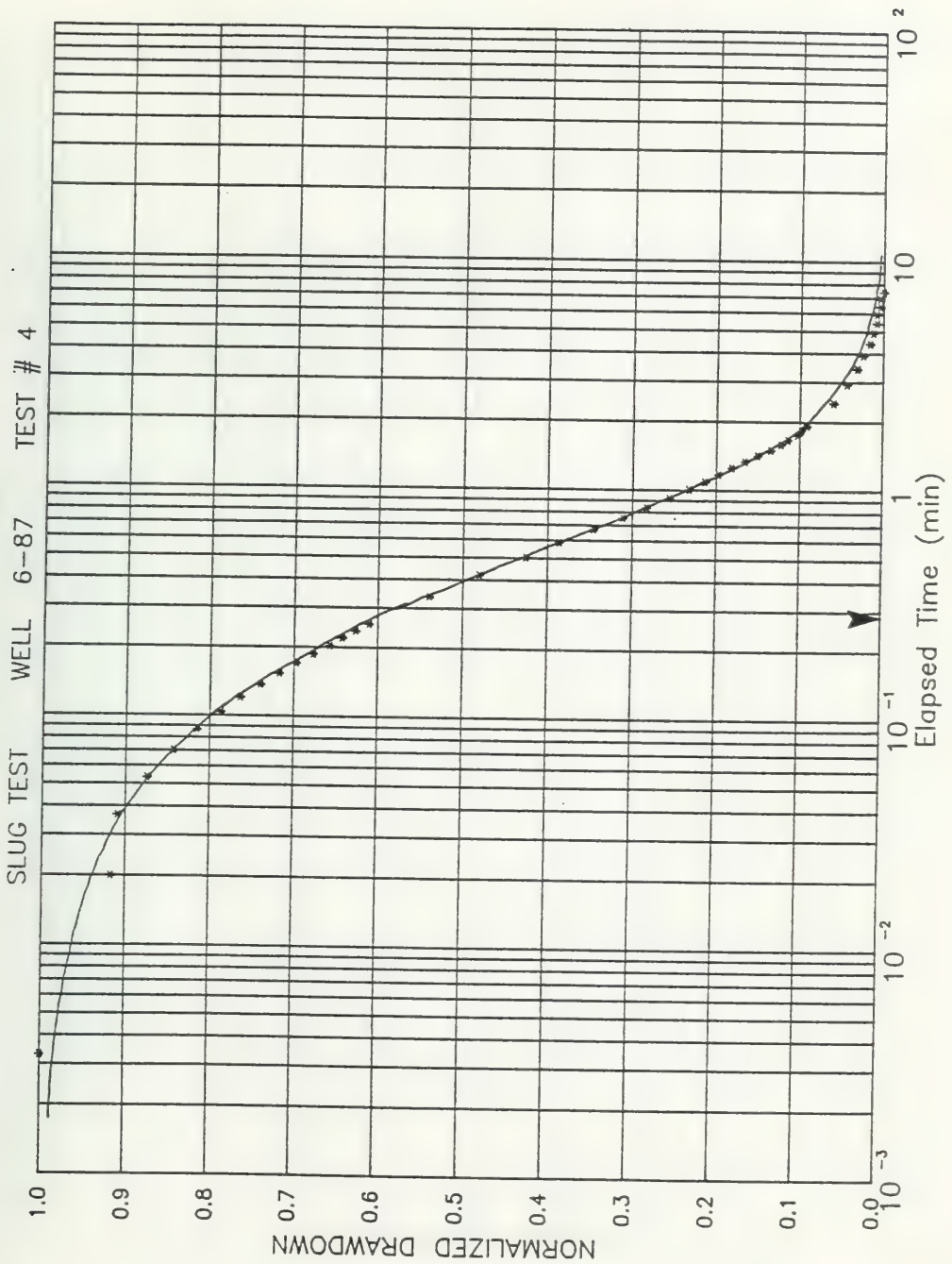


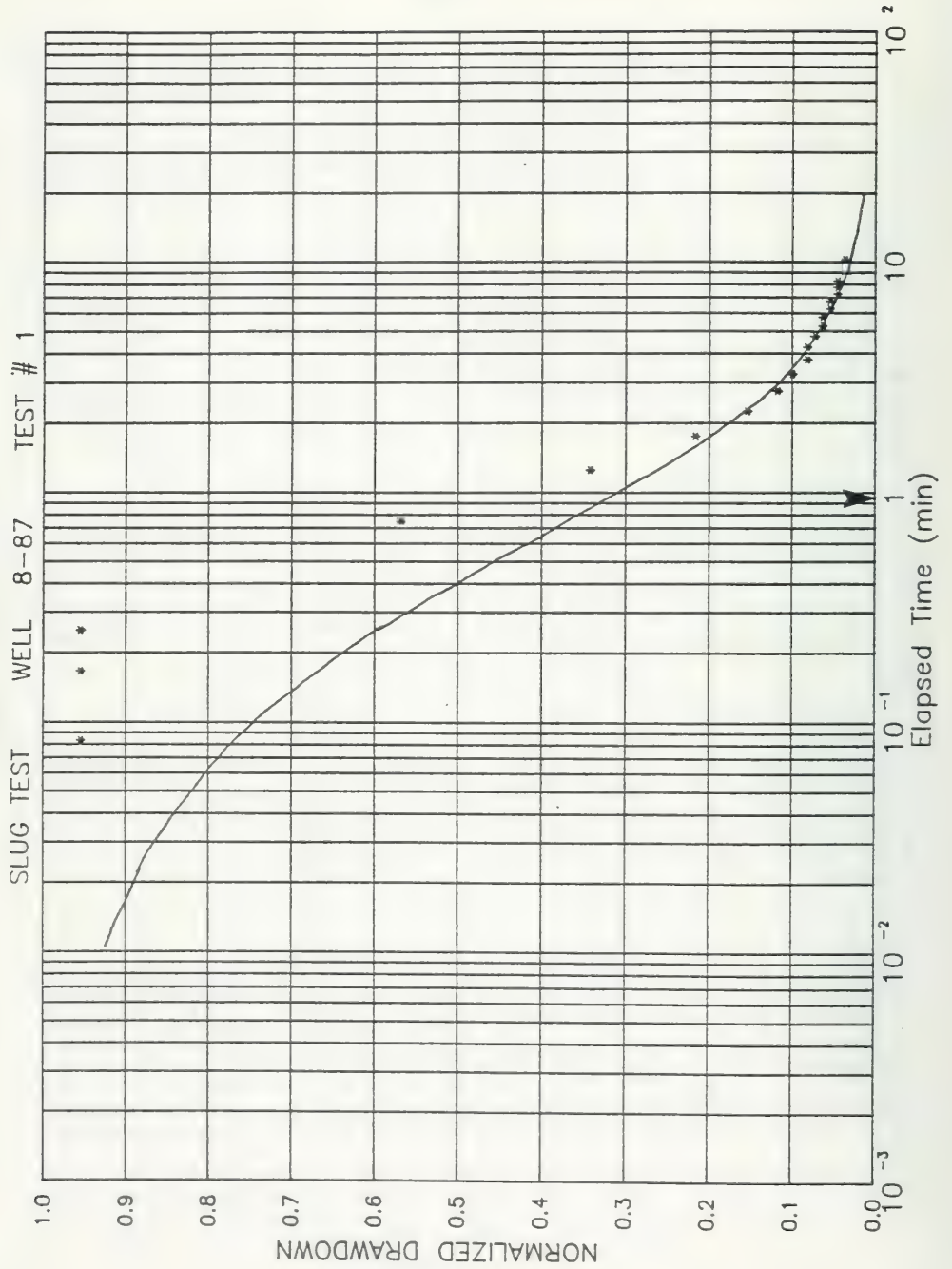


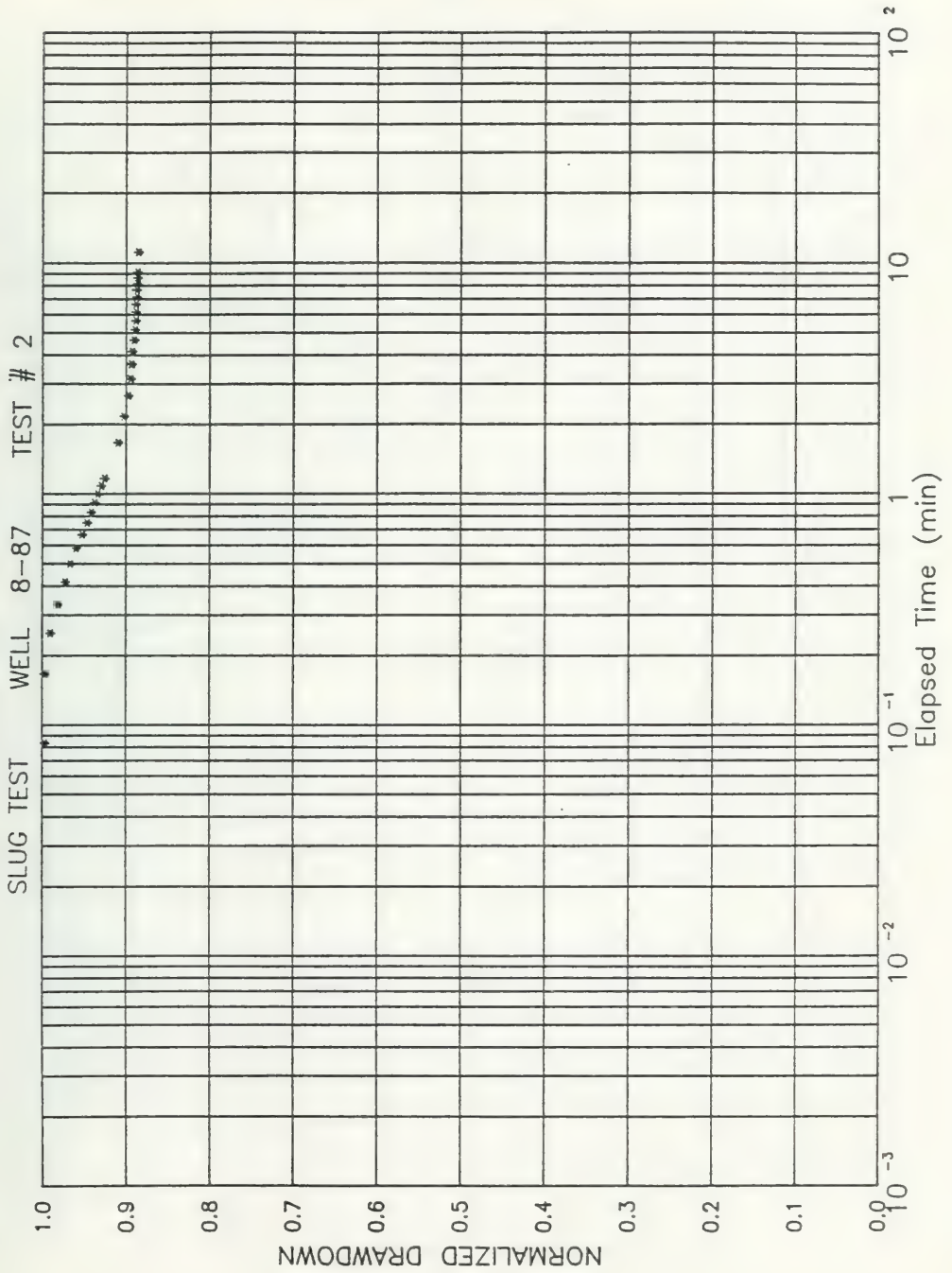


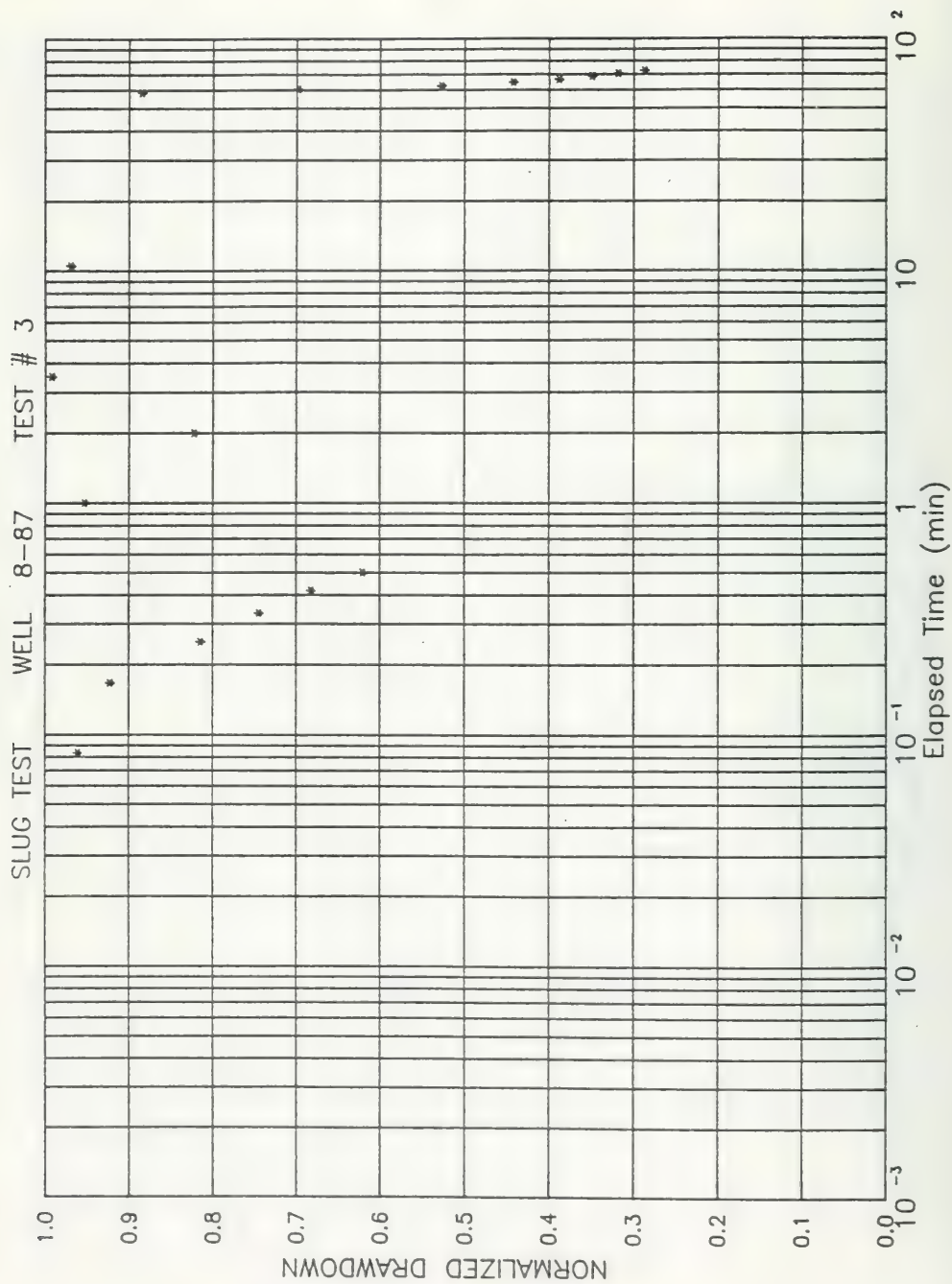


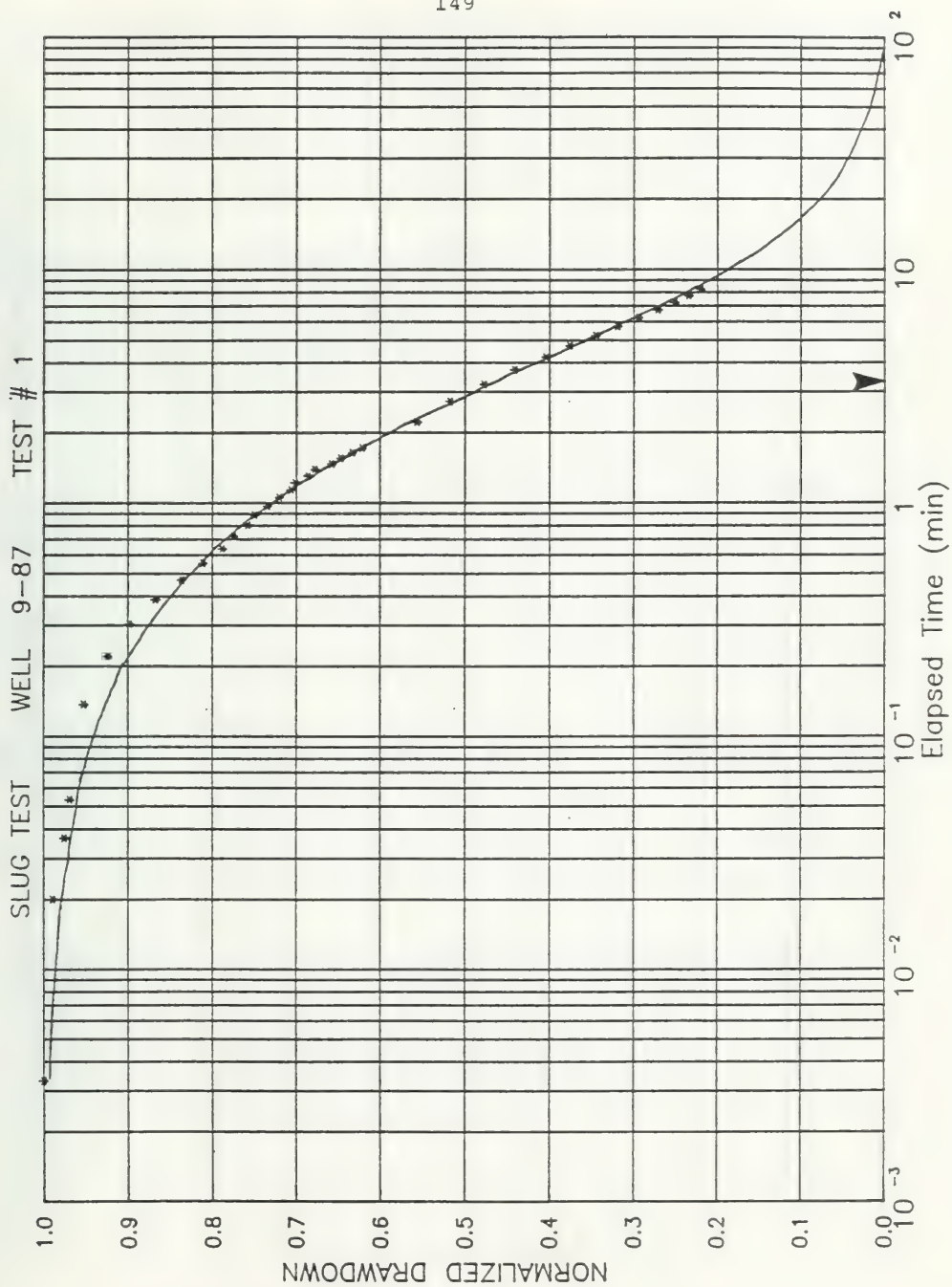


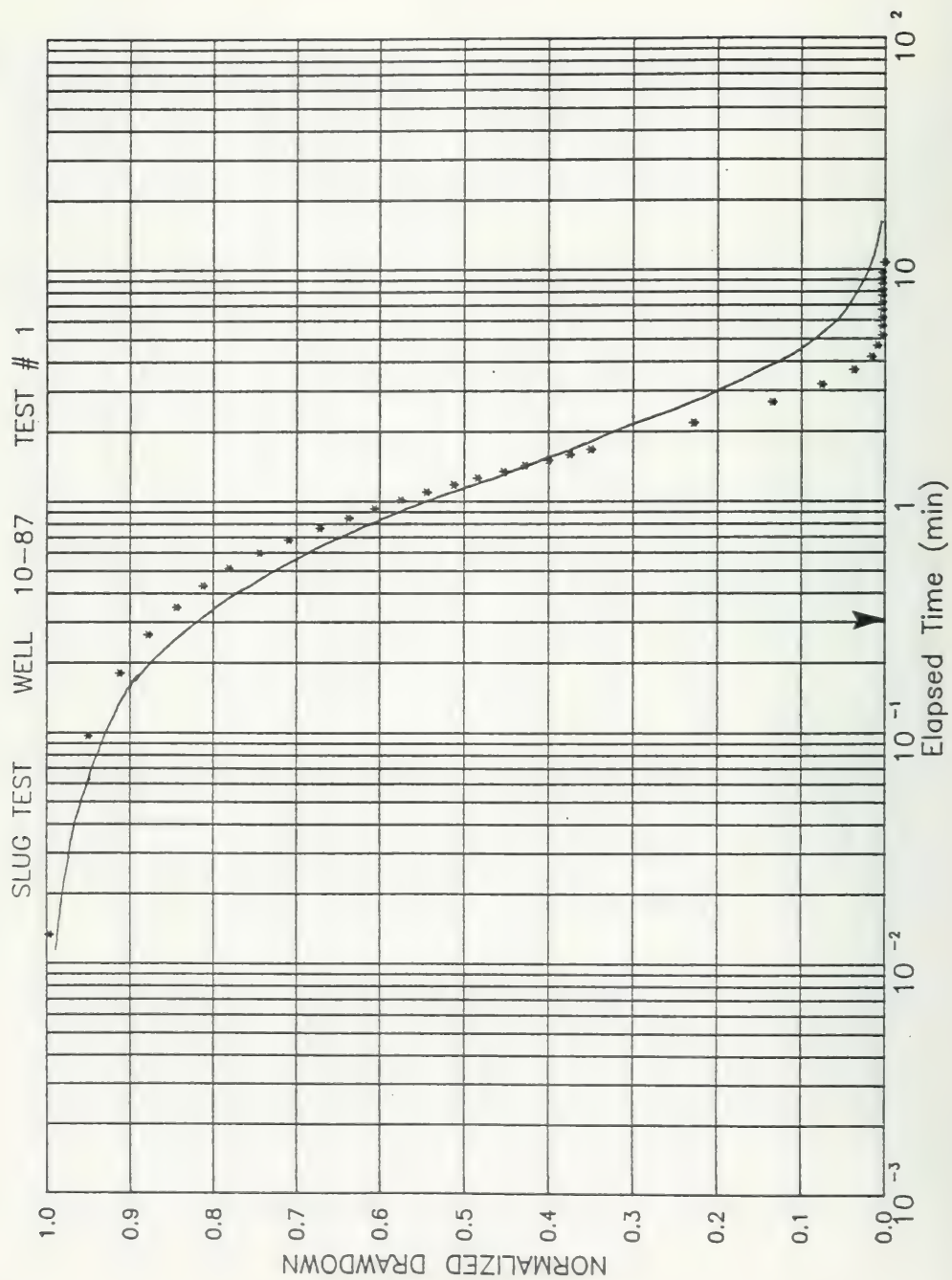


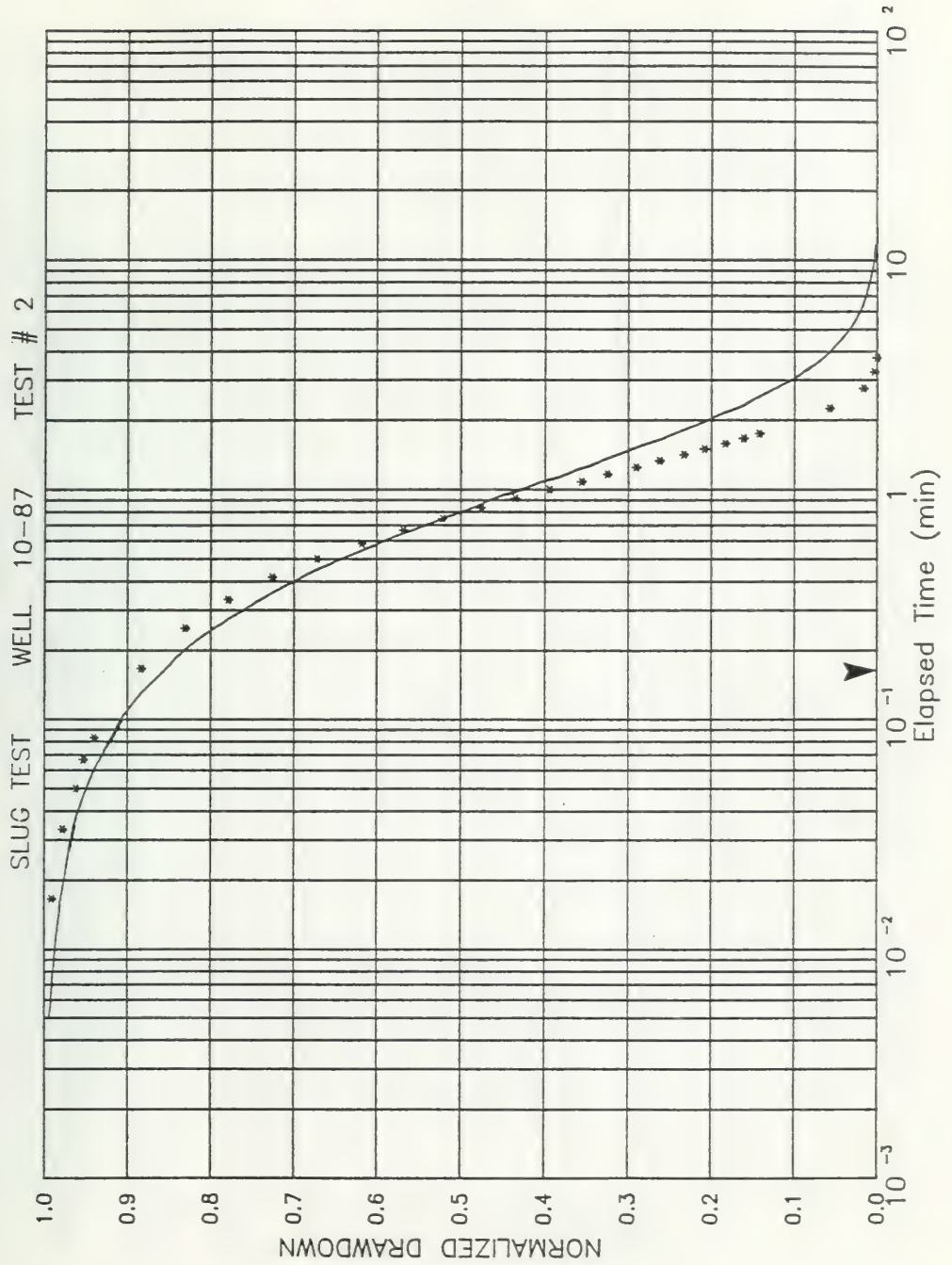


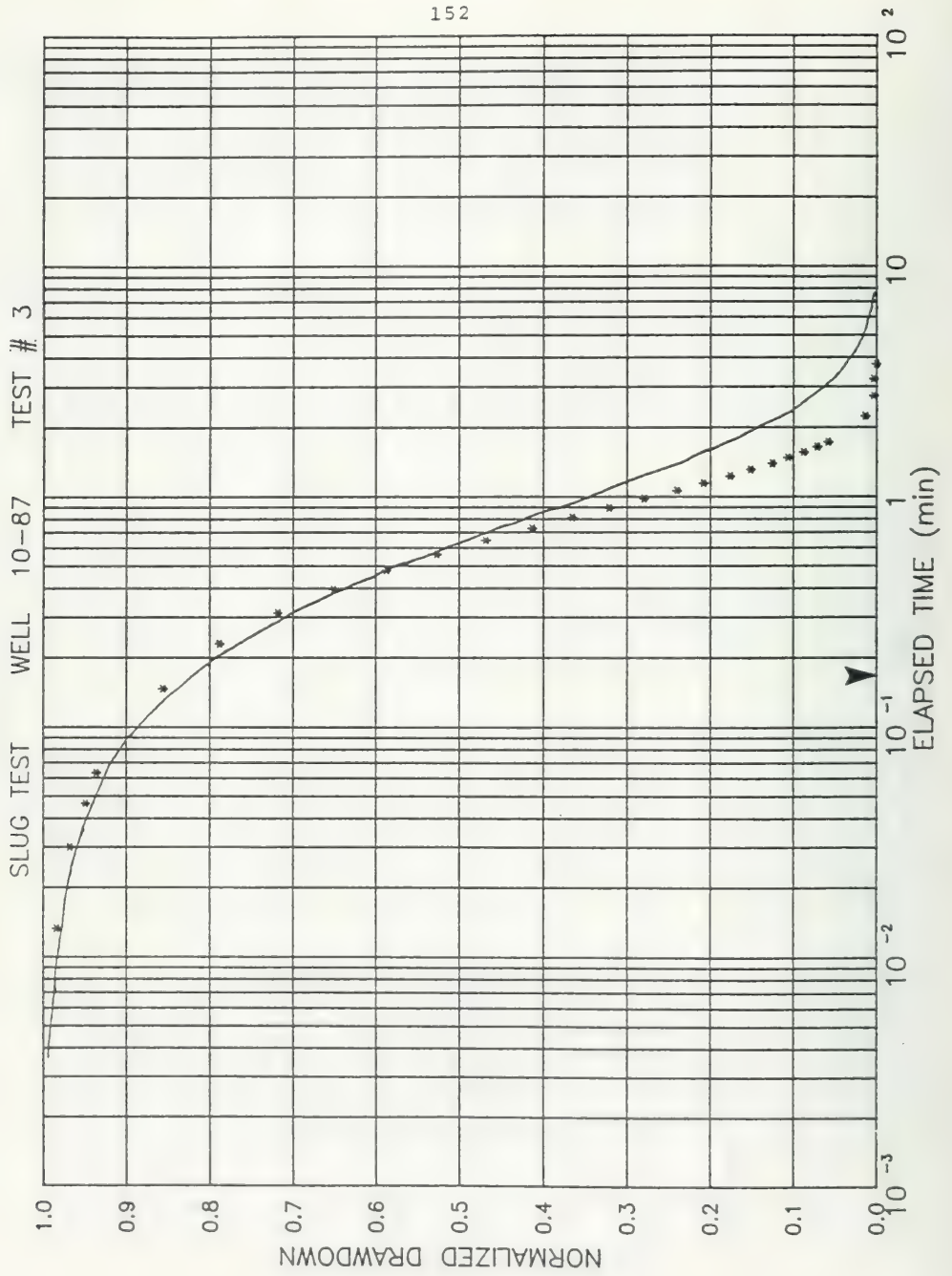


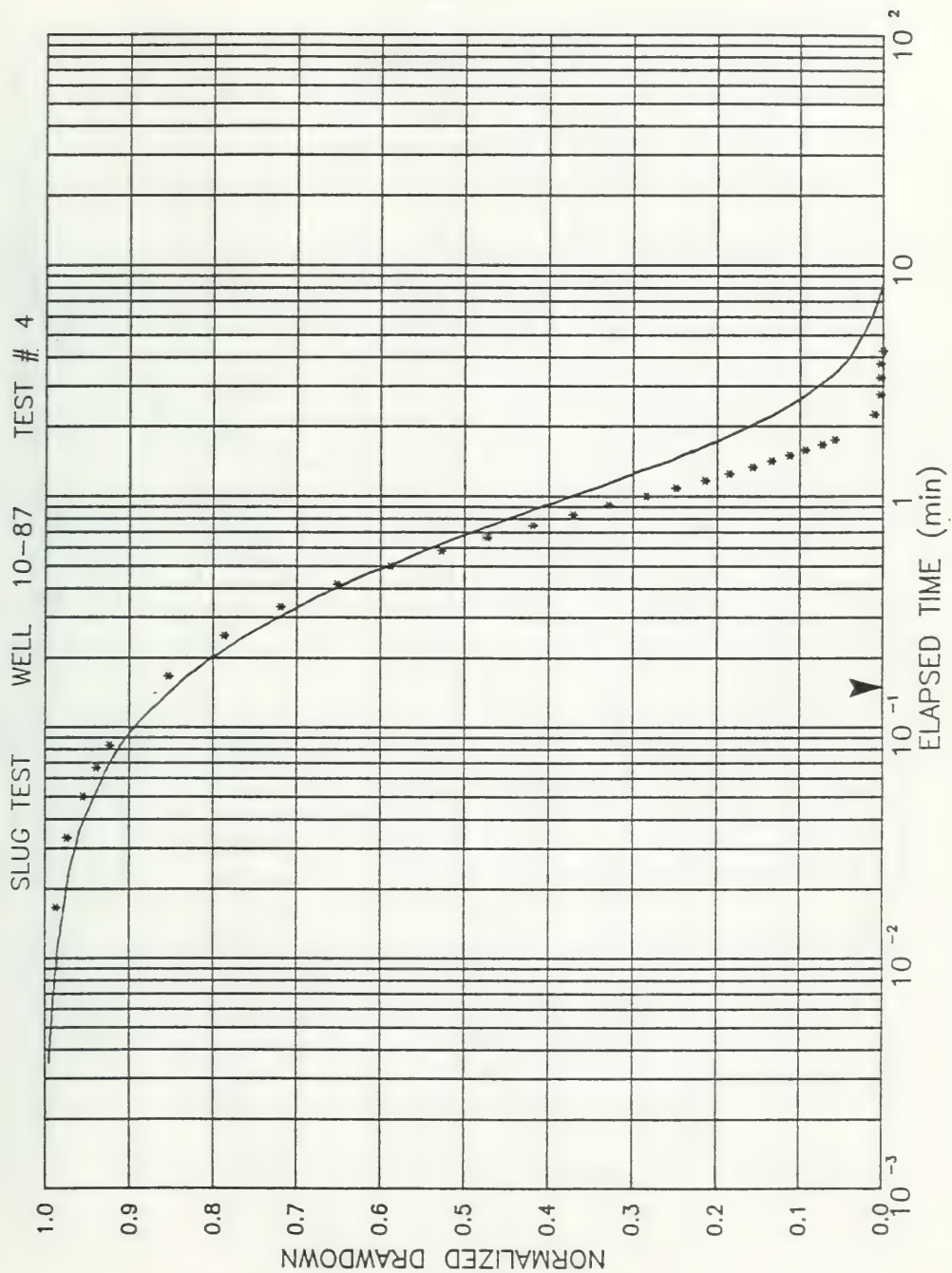




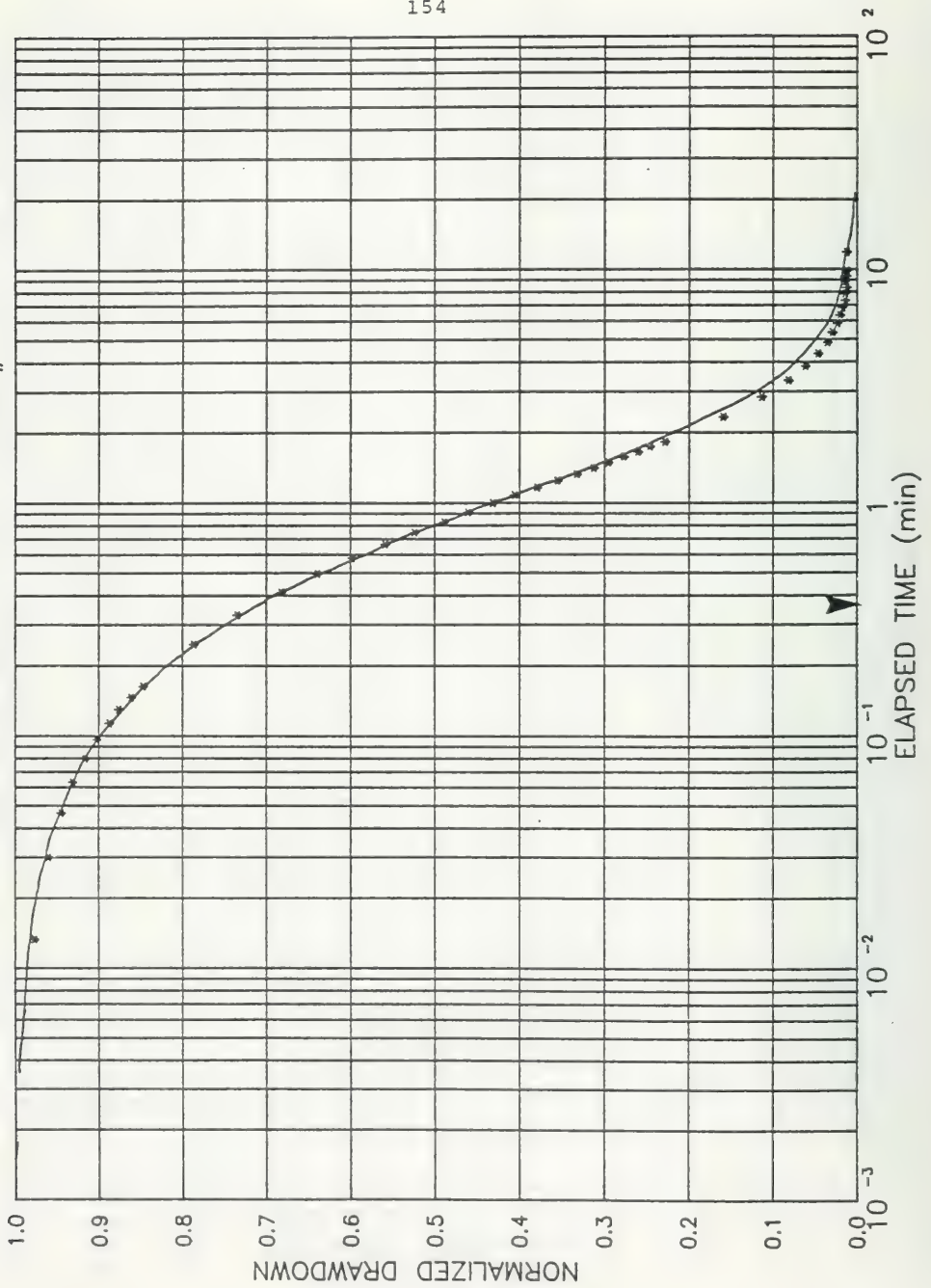


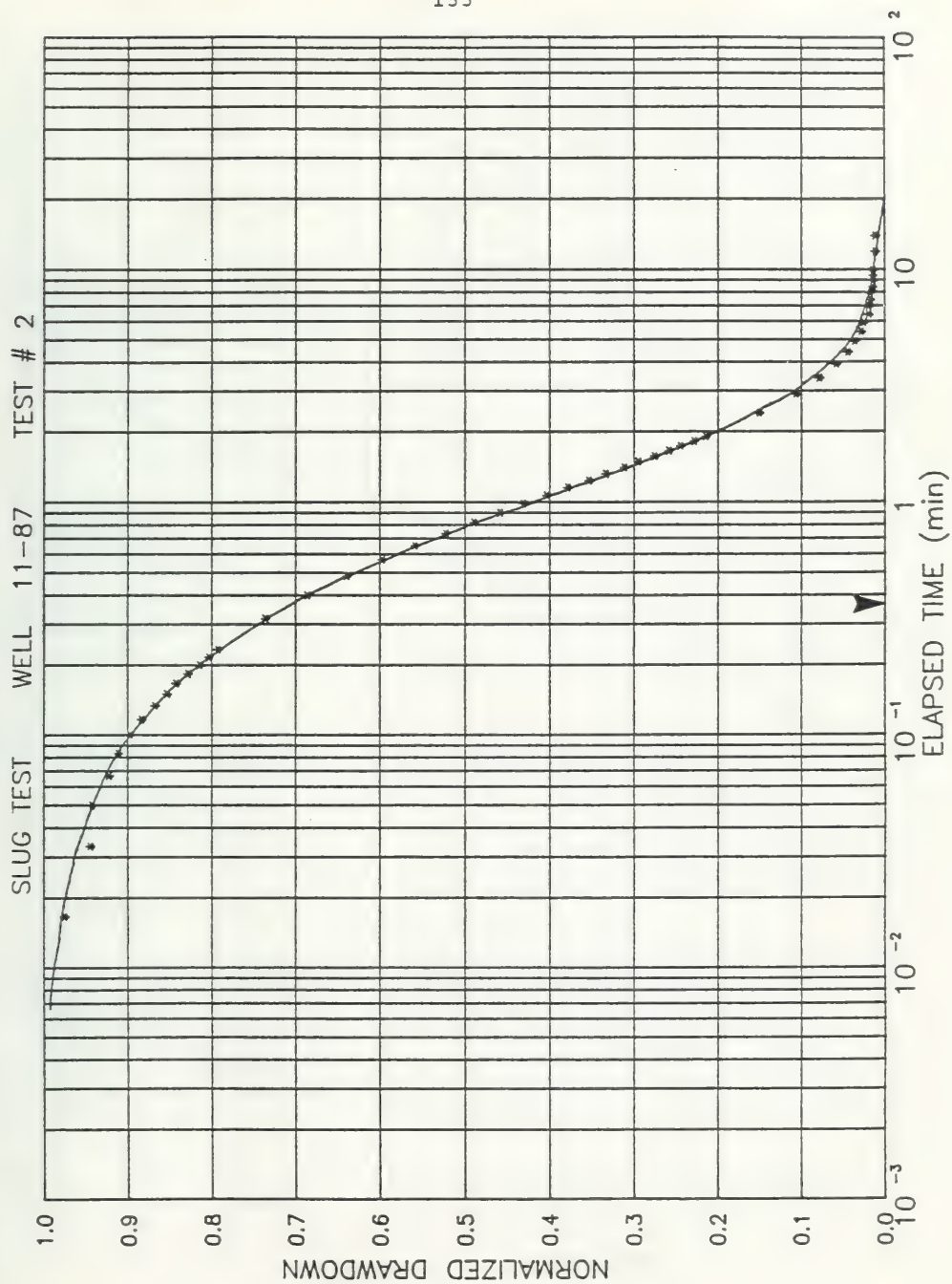


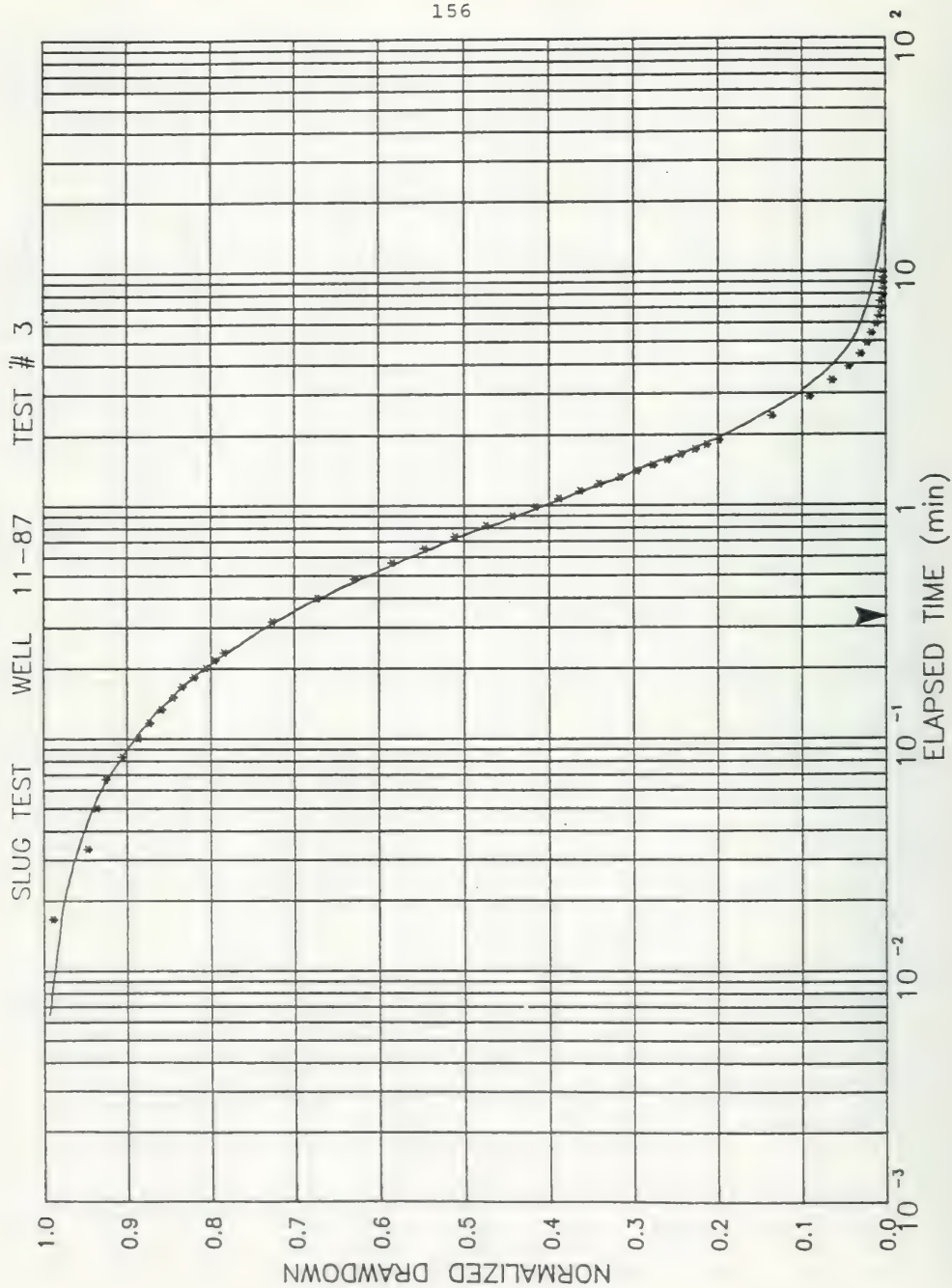




SLUG TEST WELL 11-87 TEST # 1



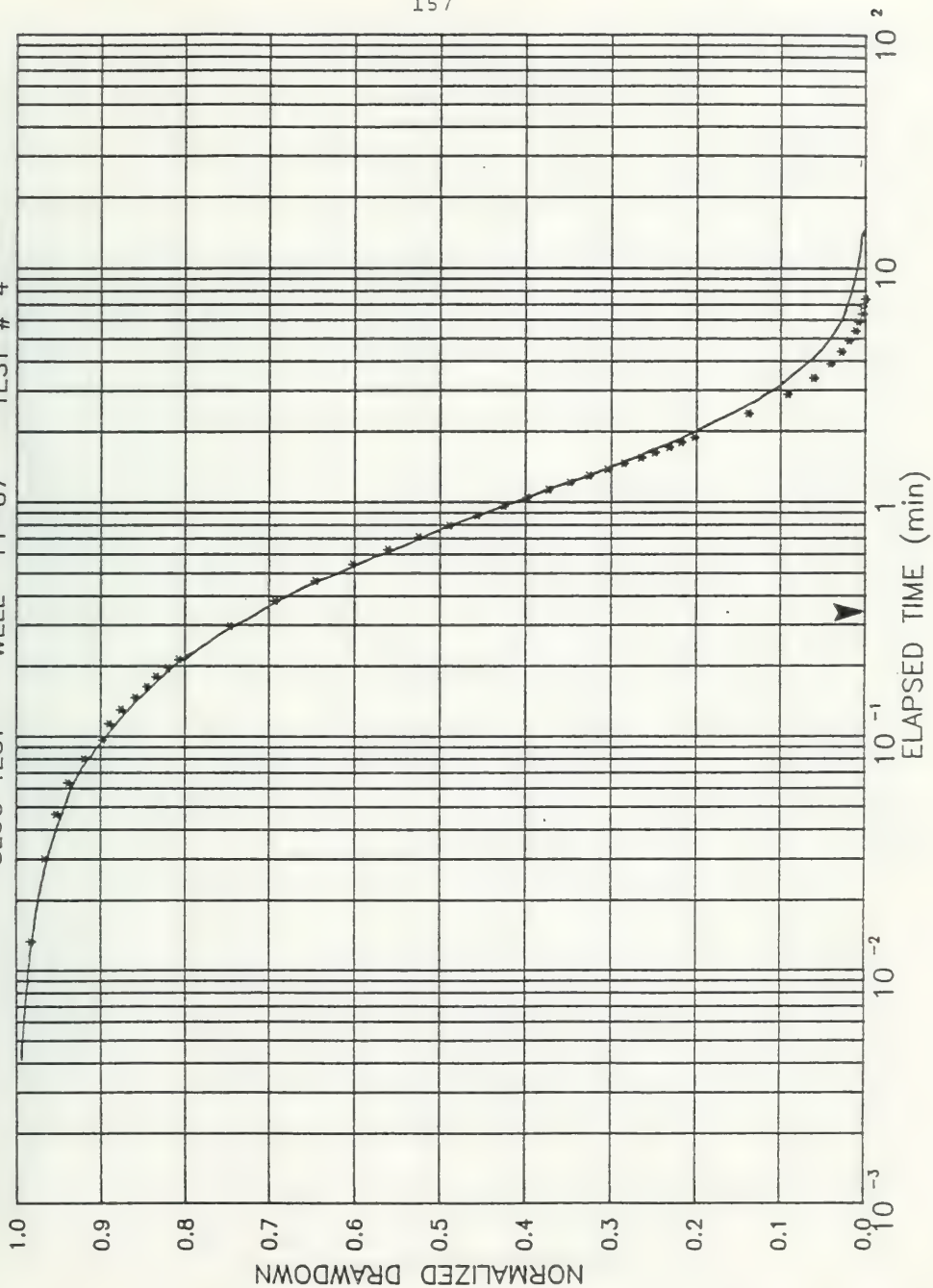




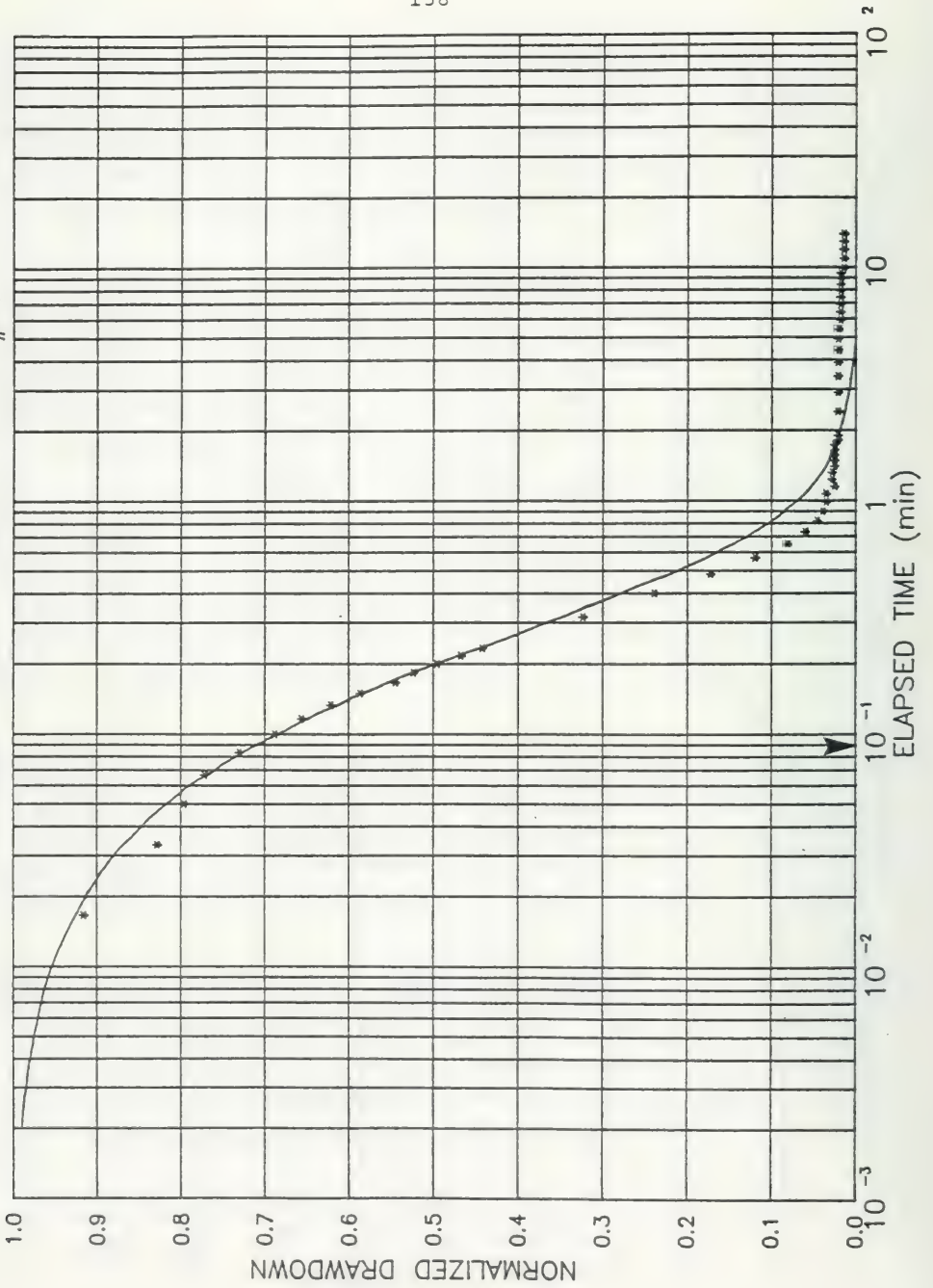
TEST # 4

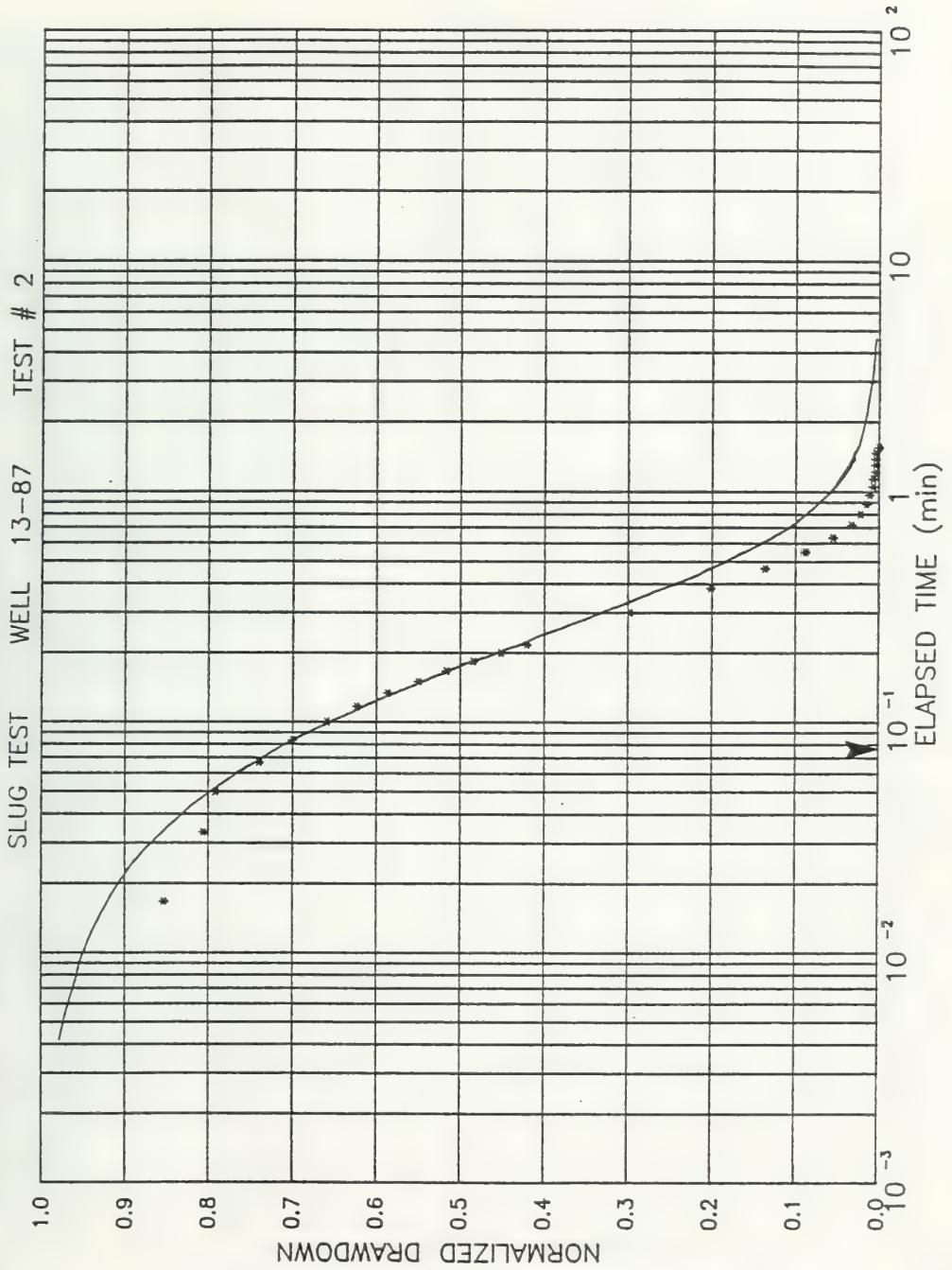
WELL 11-87

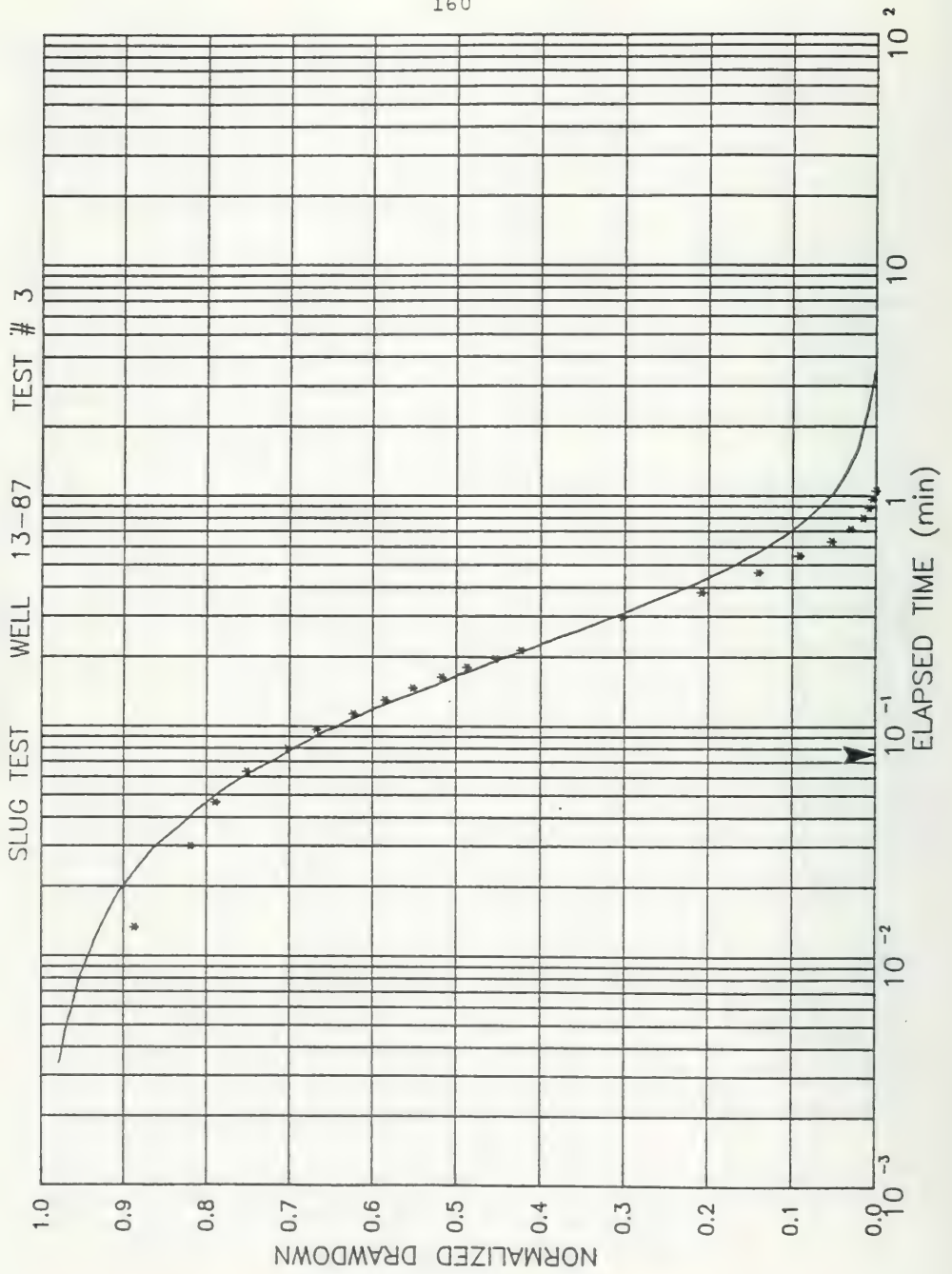
SLUG TEST

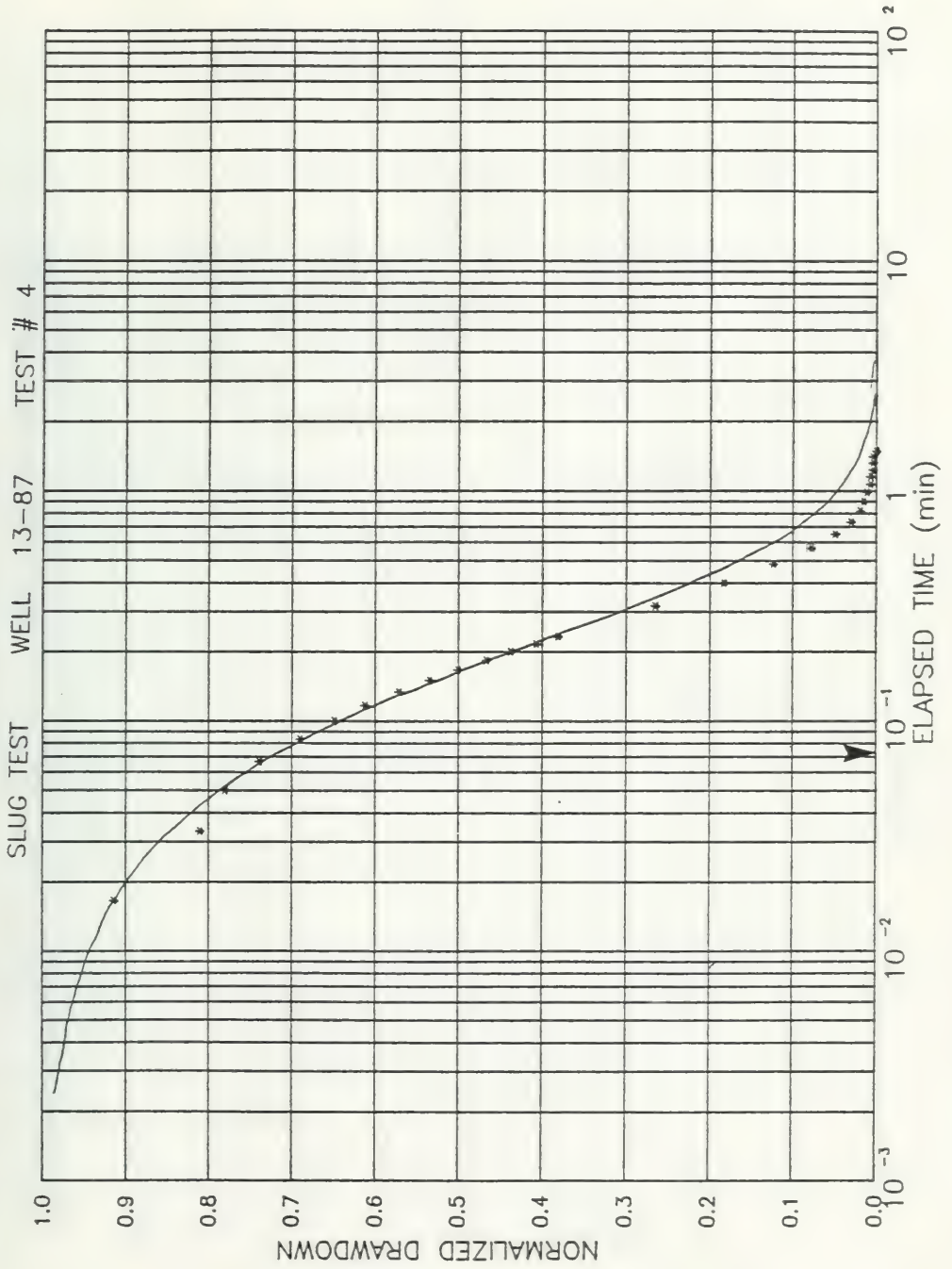


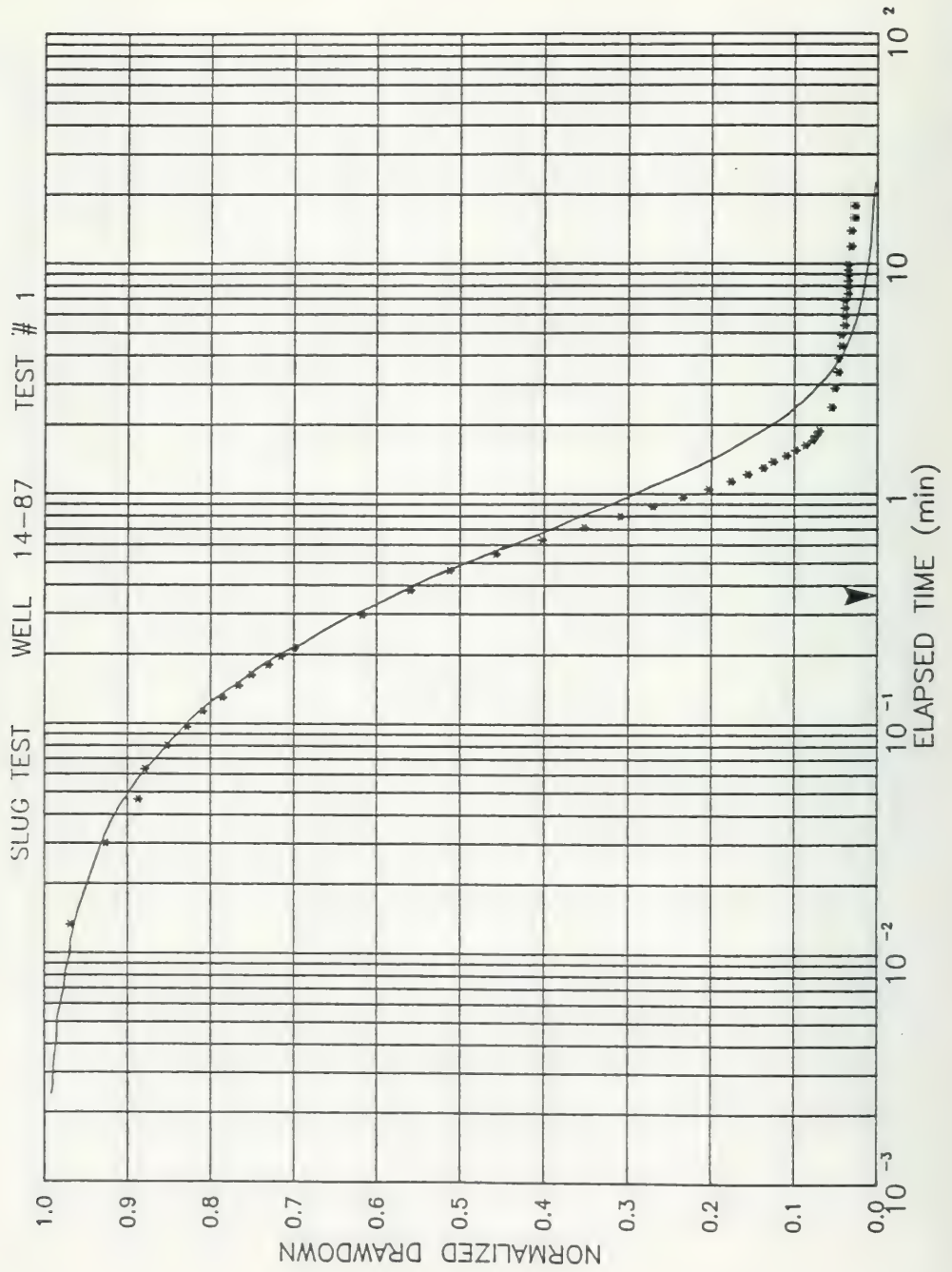
SLUG TEST WELL 13-87 TEST # 1

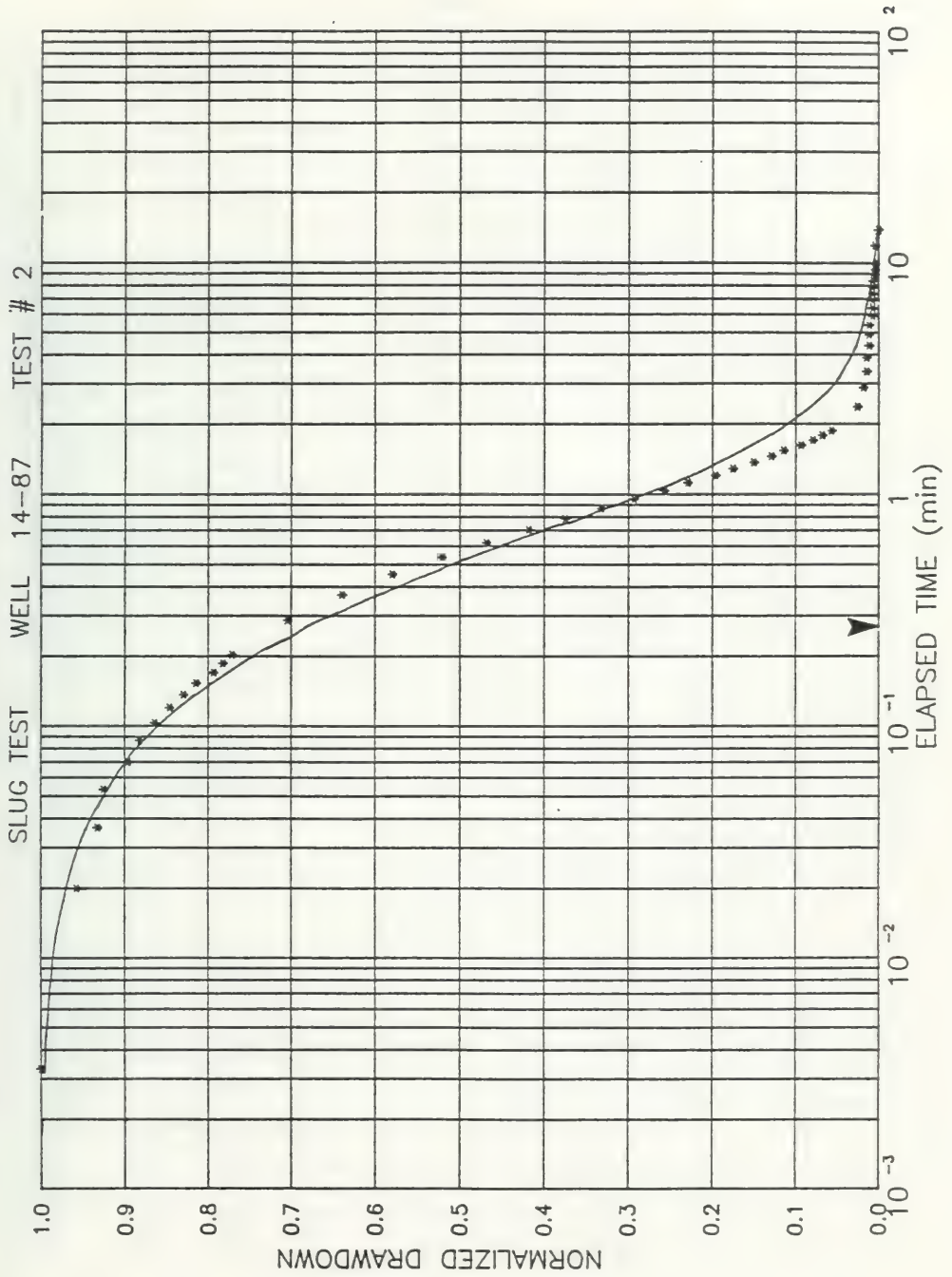


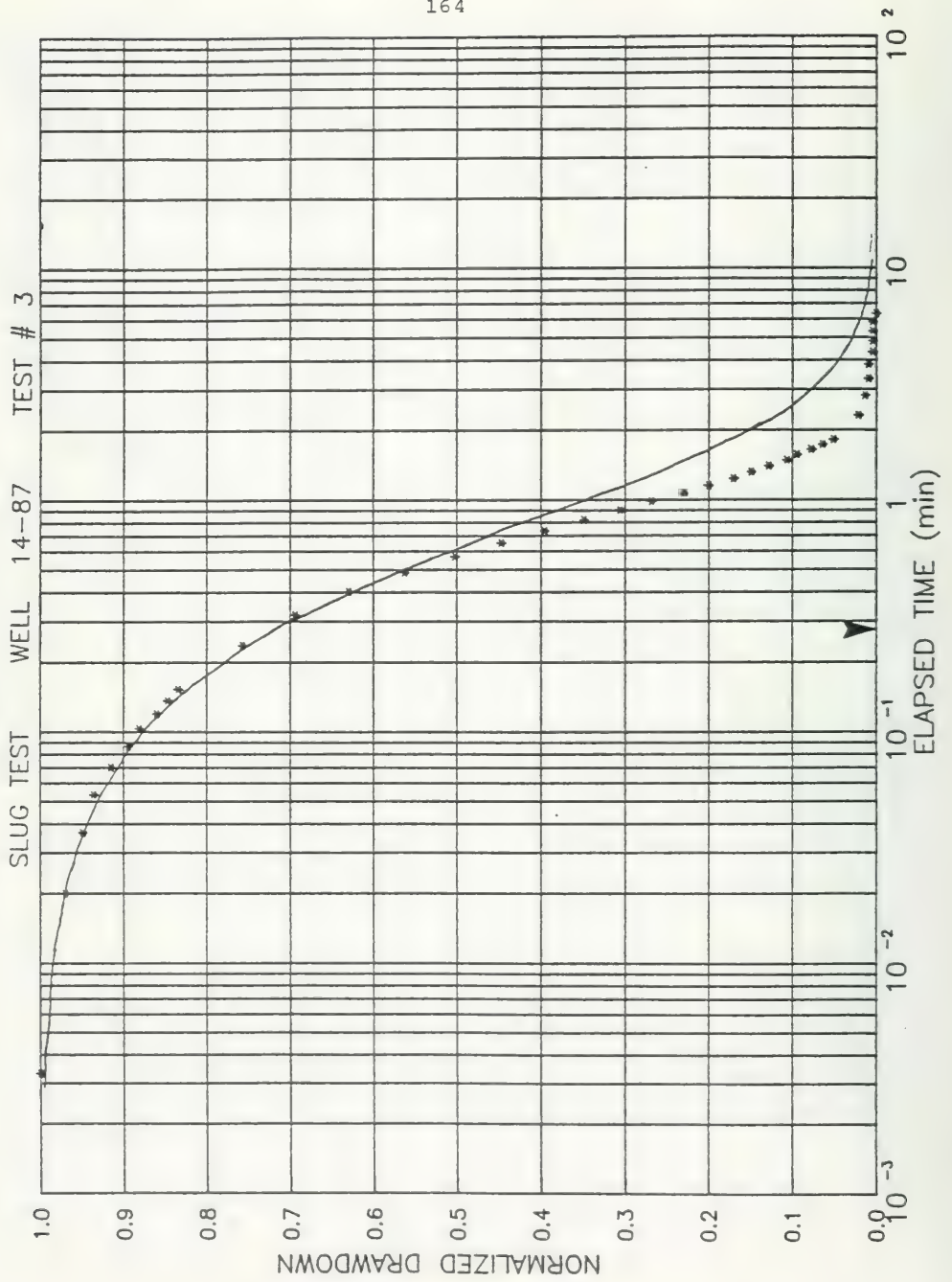


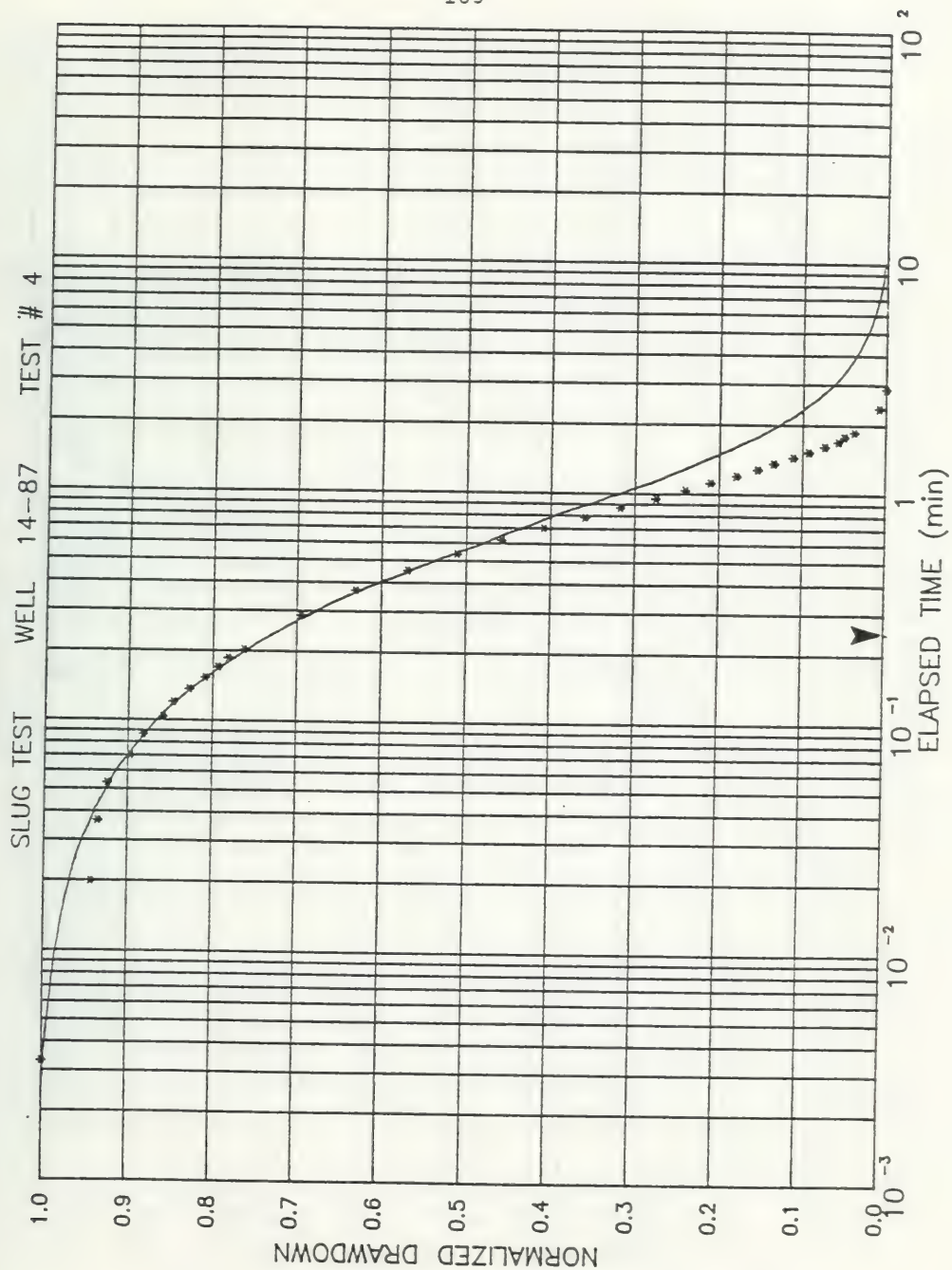


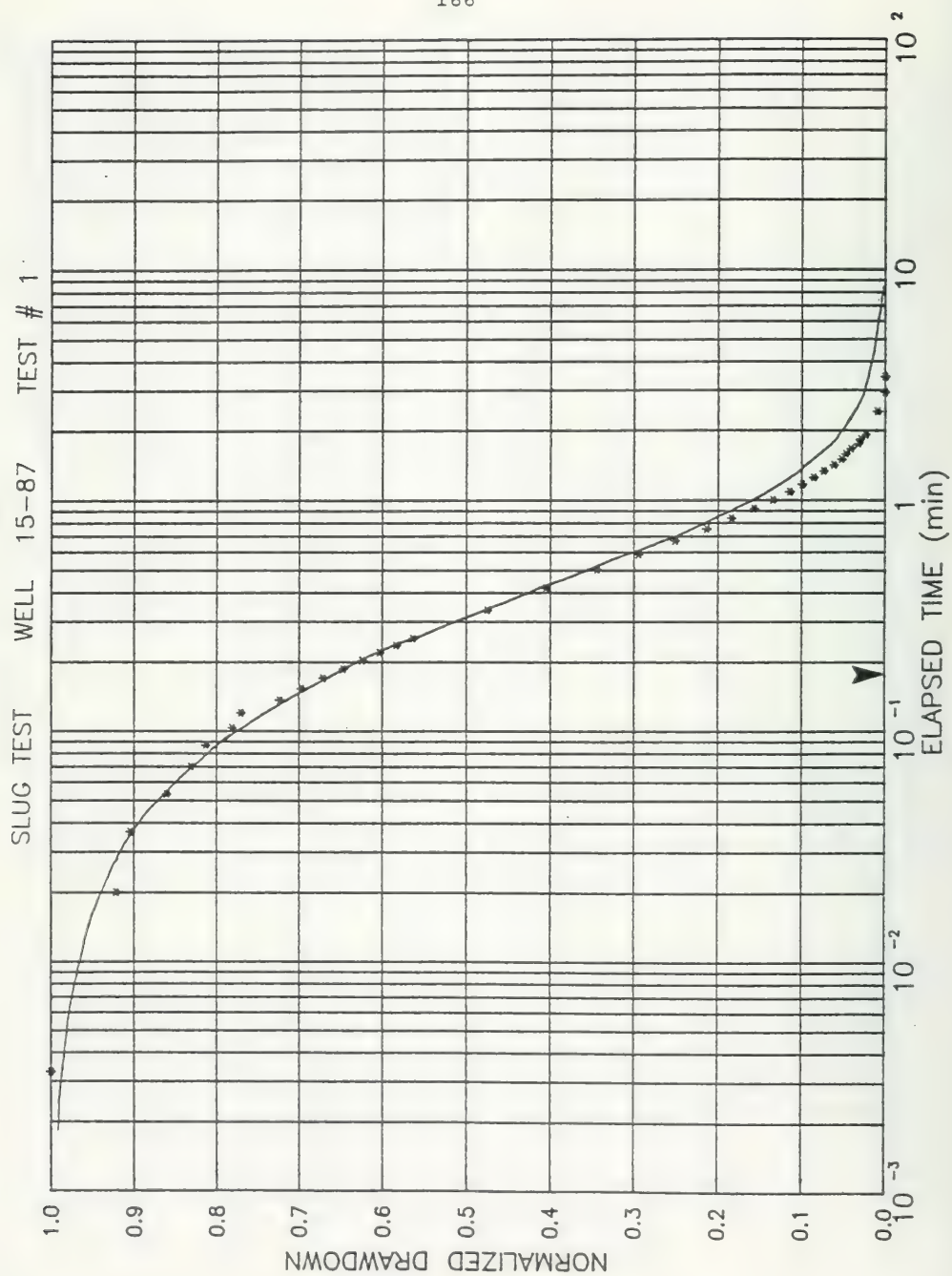


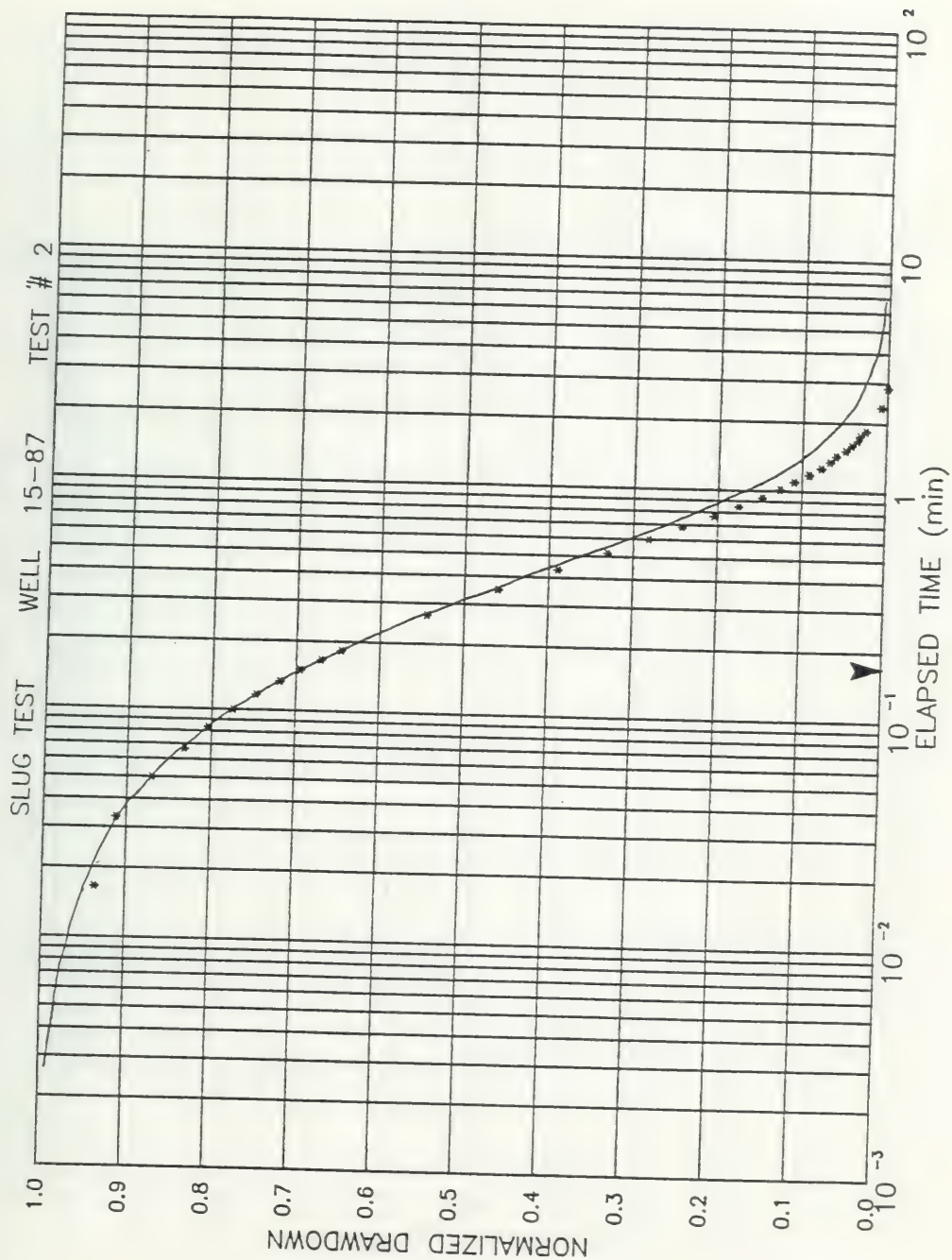


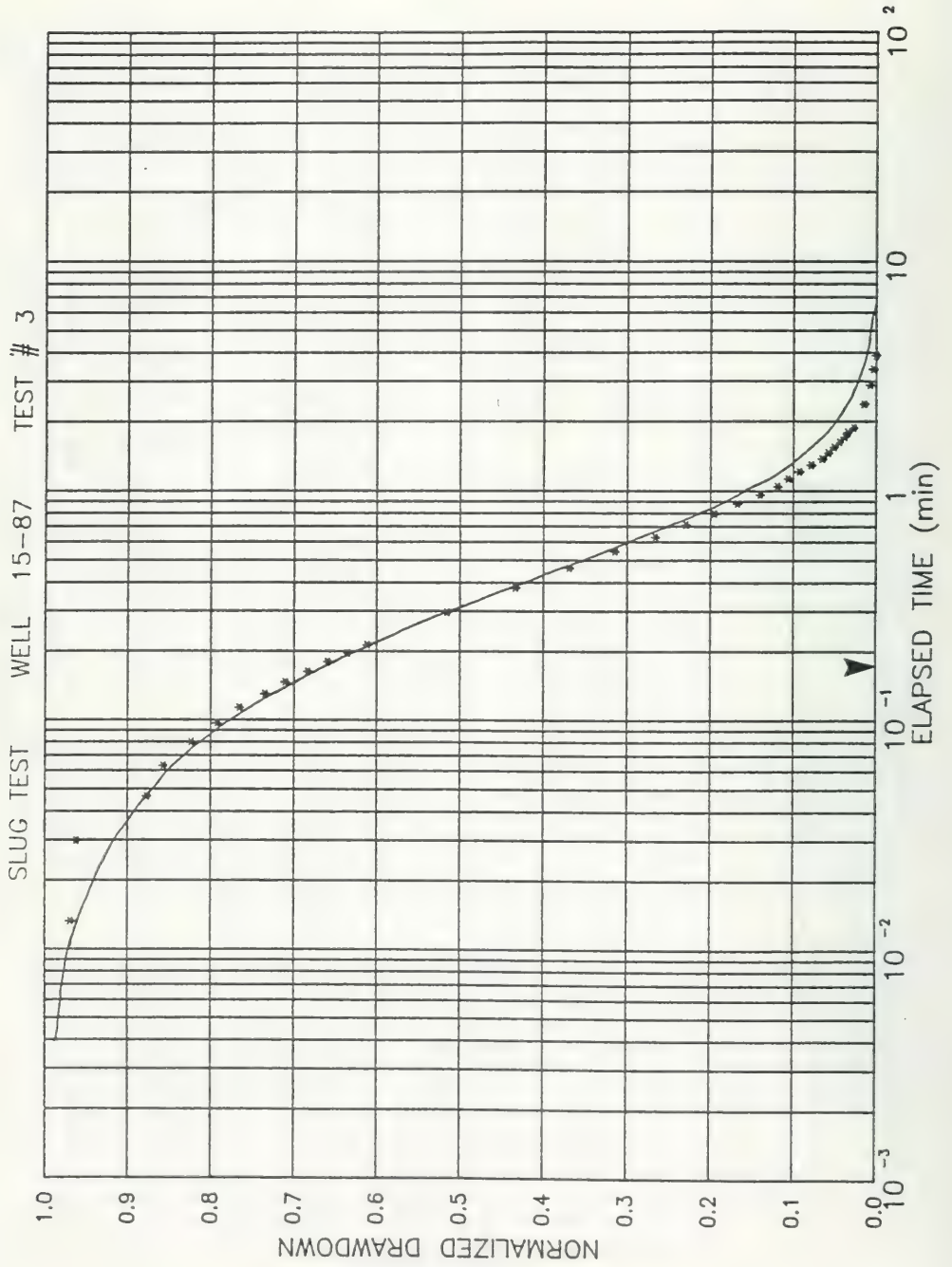


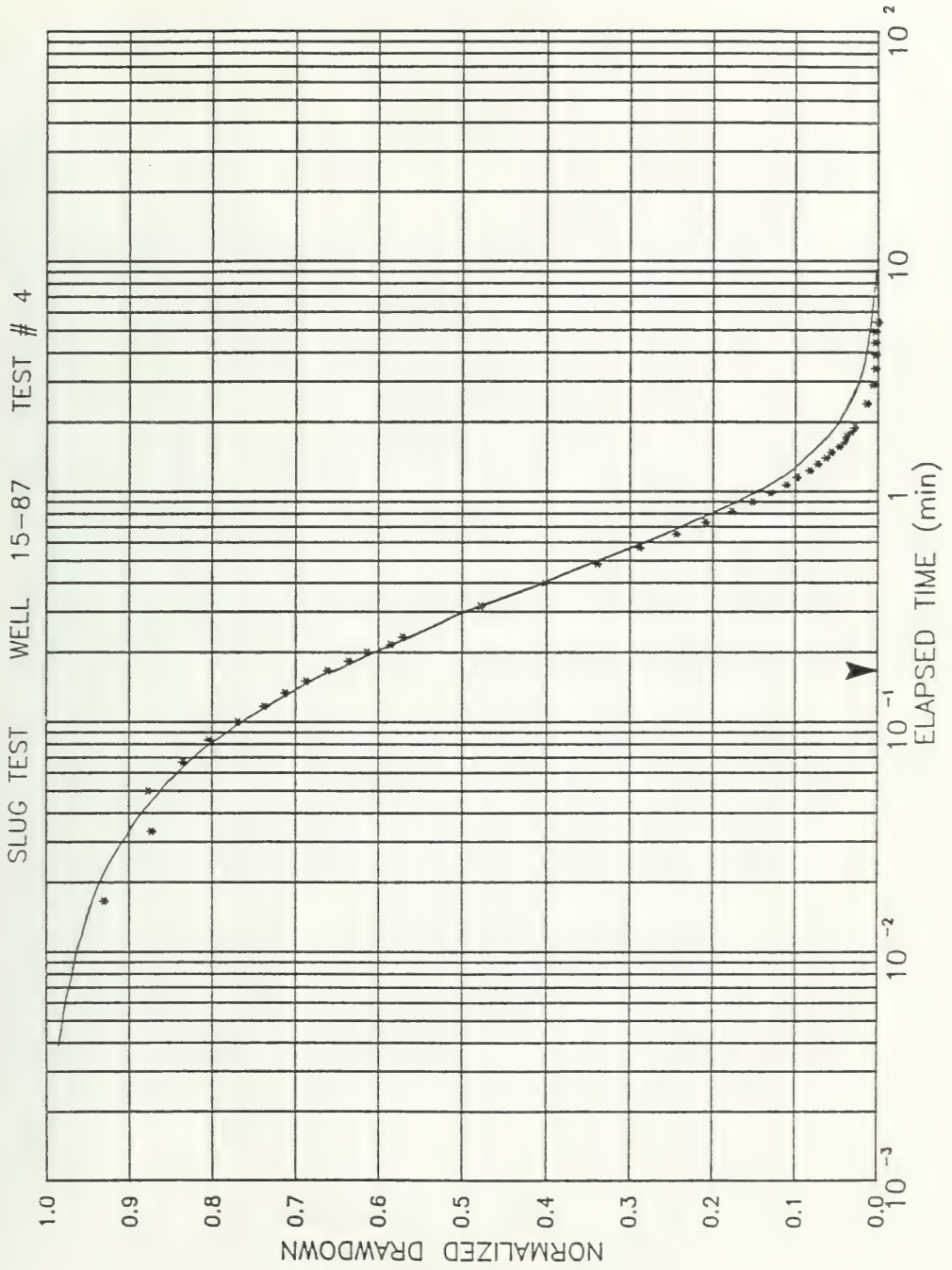












APPENDIX E2

Withdrawal Tests
Fresh Water Aquifer

Table E2-1 Summary of Withdrawal Tests
Fresh Water Aquifer

| Well | Test Duration (min) | Flow rate Q (L/min) | Drawdown H (m) | Transmissivity* T (m ² /s) | Hydraulic** Conductivity K (m/s) |
|-------|---------------------------|---------------------------|----------------------|---|---|
| 6-86 | 60 | 0.44 | 0.16 | 4×10^{-5} | 2×10^{-5} |
| 4-87 | 55 | 0.56 | 0.02 | 4×10^{-4} | 2×10^{-4} |
| 6-87 | 45 | 0.58 | 0.18 | 5×10^{-5} | 2×10^{-5} |
| 10-87 | 50 | 0.50 | 0.05 | 1×10^{-4} | 7×10^{-5} |
| 11-87 | 45 | 0.63 | 0.25 | 4×10^{-5} | 2×10^{-5} |
| 14-87 | 30 | 0.30 | 0.05 | 8×10^{-5} | 4×10^{-5} |

* Determined assuming steady radial confined flow:

$$T = \frac{Q}{\Delta H 2\pi} \ln(r_D/r_w) \quad (\text{Hvorslev, 1951})$$

where r_D = radius to constant pressure boundary, assumed equal to 5 m

r_w = radius of well, equal to 0.025 m

** Determined assuming 2 m formation thickness

APPENDIX E3

Recovery Tests
Fresh Water Aquifer

Table E3-1 Summary of Recovery Tests - Fresh Water Aquifer

| Well | Fluid Level - Date (mAMS) | Flow Rate* Q (l/min) | Average Drawdown H (m) | Transmissivity** T (m ² /S) | Hydraulic*** Conductivity (m/s) |
|-------|----------------------------------|----------------------------|---------------------------------|--|---------------------------------------|
| 3-85 | 166.79-14/9/87; 164.62-19/1/87 | 3 x 10 ⁻⁵ | 17.3 | 3 x 10 ⁻¹¹ | 1 x 10 ⁻¹¹ |
| 5-86 | 179.06-16/10/87; 179.13-19/10/87 | 3 x 10 ⁻⁵ | 0.2 | 2 x 10 ⁻⁹ | 1 x 10 ⁻⁹ |
| 7-87 | 177.79-1/10/87; 181.51-4/10/87 | 2 x 10 ⁻³ | 8.9 | 2 x 10 ⁻⁹ | 1 x 10 ⁻⁹ |
| 12-87 | 166.98-18/10/87; 167.30-19/10/87 | 4 x 10 ⁻⁴ | 11.0 | 6 x 10 ⁻¹⁰ | 3 x 10 ⁻¹⁰ |

* Flow rate determined from change in water levels and elapsed time between level measurements

** Determined assuming steady radial confined flow (Hvorslev, 1951)

$$T = \frac{Q}{\Delta H 2\pi} \ln(r_D/r_w)$$

where $r_D = 5$ m
 $r_w = 0.025$ m

*** Determined assuming formation thickness of 2 m

APPENDIX E4

Well 3-86

Pump Test - Fresh Water Aquifer

Summary Table, Drawdown Responses and
Type Curve Analyses

Table E4-1 Summary of Well 3-86 Pump Test - Fresh Water Aquifer

| Well | Radial Distance r(m) | Match Points | | | | *Transmissivity T (m ² /s) | **Storativity S |
|------|----------------------------|--------------|----------|------|------------|---|--------------------|
| | | W (u) | s (m) | 1/u | t (min) | | |
| 1-85 | 217 | 1 | 0.10 | 1 | 3.4 | 7×10^{-3} | 1×10^{-4} |
| 1-86 | 58 | 1 | 0.08 | 1 | 0.33 | 9×10^{-3} | 2×10^{-4} |
| 3-86 | 0 | 10 | 2.50 | 1000 | 6.0 | 3×10^{-3} | — |
| 4-86 | 700 | 1 | 0.15 | 1 | 31.0 | 5×10^{-3} | 7×10^{-5} |
| 7-86 | 605 | 1 | 0.03 | 1 | 15.0 | 2×10^{-2} | 2×10^{-4} |
| AQ1 | 400 | 1 | 0.09 | 1 | 140.0 | 8×10^{-3} | 1×10^{-3} |
| AQ2 | 470 | 1 | 0.28 | 1 | 78.0 | 3×10^{-3} | 2×10^{-4} |
| AQ3 | 740 | 1 | 0.19 | 1 | 65.0 | 7×10^{-3} | 1×10^{-4} |
| AQ11 | 460 | 1 | 0.21 | 1 | 42.0 | 3×10^{-3} | 2×10^{-4} |

* Determined from $T = \frac{Q W(u)}{4\pi s}$ (Theis, 1935)

where $Q = 560$ L/min

**Determined from $S = \frac{4Ttu}{r^2}$ (Theis, 1935)

MONITORING WELL : 1-85

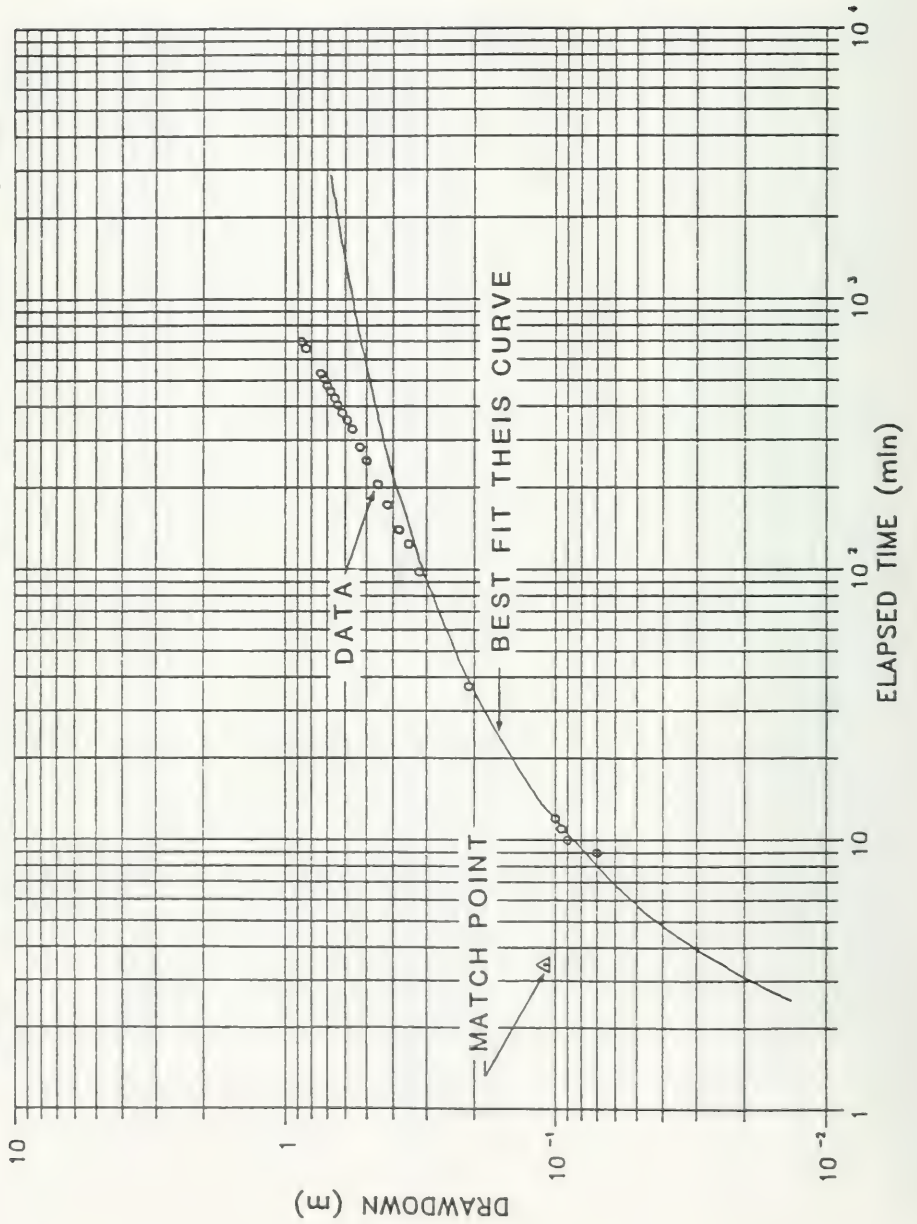
Drawdown

| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 08:15:00 | 0.000 | 4.140 | 0.000 |
| 08:24:00 | 9.000 | 4.210 | 0.070 |
| 08:25:00 | 10.000 | 4.230 | 0.090 |
| 08:26:00 | 11.000 | 4.235 | 0.095 |
| 08:27:00 | 12.000 | 4.240 | 0.100 |
| 08:52:00 | 37.000 | 4.350 | 0.210 |
| 09:53:00 | 98.000 | 4.460 | 0.320 |
| 10:19:00 | 124.000 | 4.490 | 0.350 |
| 10:35:00 | 140.000 | 4.520 | 0.380 |
| 11:09:00 | 173.000 | 4.560 | 0.420 |
| 11:41:00 | 206.000 | 4.595 | 0.455 |
| 12:27:00 | 252.000 | 4.640 | 0.500 |
| 12:58:00 | 283.000 | 4.670 | 0.530 |
| 13:45:00 | 330.000 | 4.705 | 0.565 |
| 14:11:00 | 356.000 | 4.730 | 0.590 |
| 14:33:00 | 378.000 | 4.755 | 0.615 |
| 15:00:00 | 405.000 | 4.780 | 0.640 |
| 15:24:00 | 429.000 | 4.795 | 0.655 |
| 15:51:00 | 456.000 | 4.820 | 0.680 |
| 16:13:00 | 478.000 | 4.840 | 0.700 |
| 16:42:00 | 507.000 | 4.860 | 0.720 |
| 17:06:00 | 531.000 | 4.880 | 0.740 |
| 19:12:00 | 657.000 | 4.980 | 0.840 |
| 19:53:00 | 698.000 | 5.010 | 0.870 |

Recovery

| | | | |
|----------|----------|-------|-------|
| 20:19:00 | 724.000 | 5.005 | 0.865 |
| 20:20:00 | 725.000 | 4.995 | 0.855 |
| 20:21:00 | 726.000 | 4.980 | 0.840 |
| 20:22:00 | 727.000 | 4.975 | 0.835 |
| 20:23:00 | 728.000 | 4.965 | 0.825 |
| 20:25:00 | 730.000 | 4.955 | 0.815 |
| 20:27:00 | 732.000 | 4.945 | 0.805 |
| 20:29:00 | 734.000 | 4.935 | 0.795 |
| 20:32:00 | 737.000 | 4.920 | 0.780 |
| 20:40:00 | 745.000 | 4.895 | 0.755 |
| 21:00:00 | 765.000 | 4.860 | 0.720 |
| 21:35:00 | 800.000 | 4.825 | 0.685 |
| 21:55:00 | 820.000 | 4.800 | 0.660 |
| 22:05:00 | 830.000 | 4.790 | 0.650 |
| 09:05:00 | 1490.000 | 4.630 | 0.490 |
| 16:55:00 | 1960.000 | 4.565 | 0.425 |

WELL 3-86 PUMP TEST RESPONSE IN WELL 1-85



MONITORING WELL : Prince of Wales (Deep), 1-86

Drawdown

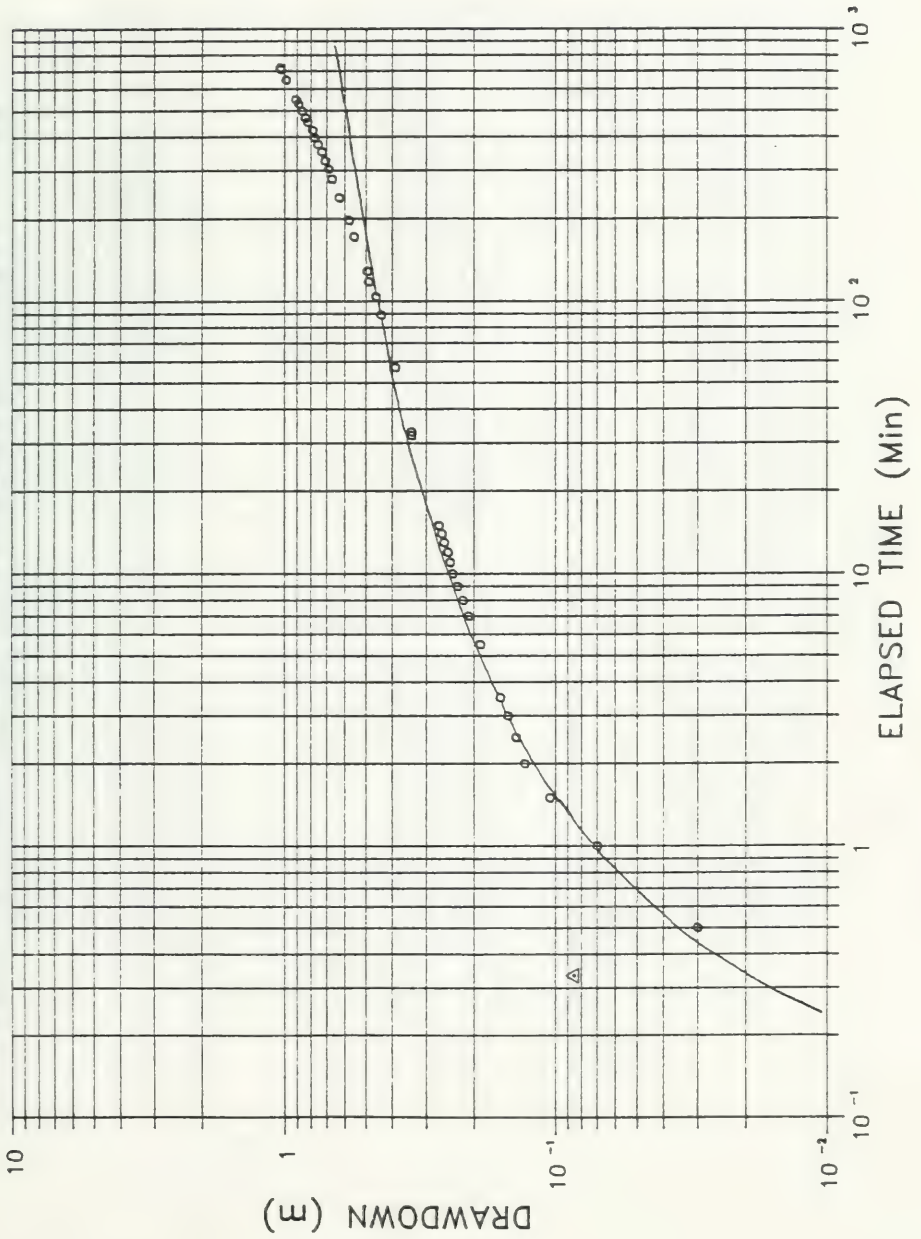
| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 08:15:00 | 0.000 | 6.060 | 0.000 |
| 08:15:30 | 0.500 | 6.090 | 0.030 |
| 08:16:00 | 1.000 | 6.130 | 0.070 |
| 08:16:30 | 1.500 | 6.165 | 0.105 |
| 08:17:00 | 2.000 | 6.190 | 0.130 |
| 08:17:30 | 2.500 | 6.200 | 0.140 |
| 08:18:00 | 3.000 | 6.210 | 0.150 |
| 08:18:30 | 3.500 | 6.220 | 0.160 |
| 08:20:30 | 5.500 | 6.250 | 0.190 |
| 08:22:00 | 7.000 | 6.270 | 0.210 |
| 08:23:00 | 8.000 | 6.280 | 0.220 |
| 08:24:00 | 9.000 | 6.290 | 0.230 |
| 08:25:00 | 10.000 | 6.300 | 0.240 |
| 08:26:00 | 11.000 | 6.305 | 0.245 |
| 08:27:00 | 12.000 | 6.310 | 0.250 |
| 08:28:00 | 13.000 | 6.318 | 0.258 |
| 08:29:00 | 14.000 | 6.323 | 0.263 |
| 08:30:00 | 15.000 | 6.330 | 0.270 |
| 08:47:00 | 32.000 | 6.400 | 0.340 |
| 08:48:00 | 33.000 | 6.400 | 0.340 |
| 09:12:00 | 57.000 | 6.450 | 0.390 |
| 09:44:00 | 89.000 | 6.500 | 0.440 |
| 09:59:00 | 104.000 | 6.520 | 0.460 |
| 10:13:00 | 118.000 | 6.550 | 0.490 |
| 10:24:00 | 129.000 | 6.555 | 0.495 |
| 11:07:00 | 172.000 | 6.615 | 0.555 |
| 11:33:00 | 198.000 | 6.640 | 0.580 |
| 12:14:00 | 239.000 | 6.690 | 0.630 |
| 12:55:00 | 280.000 | 6.730 | 0.670 |
| 13:20:00 | 305.000 | 6.750 | 0.690 |
| 13:42:00 | 327.000 | 6.770 | 0.710 |
| 14:08:00 | 353.000 | 6.790 | 0.730 |
| 14:30:00 | 375.000 | 6.815 | 0.755 |
| 14:54:00 | 399.000 | 6.840 | 0.780 |
| 15:18:00 | 423.000 | 6.850 | 0.790 |
| 15:48:00 | 453.000 | 6.885 | 0.825 |
| 16:06:00 | 471.000 | 6.900 | 0.840 |
| 16:34:00 | 499.000 | 6.925 | 0.865 |
| 17:04:00 | 529.000 | 6.950 | 0.890 |
| 17:24:00 | 549.000 | 6.970 | 0.910 |
| 19:04:00 | 649.000 | 7.050 | 0.990 |
| 20:03:00 | 708.000 | 7.095 | 1.035 |
| 20:14:30 | 719.000 | 7.100 | 1.040 |

MONITORING WELL : Prince of Wales (Deep), 1-86 (continued)

Recovery

| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 20:16:00 | 721.000 | 7.050 | 0.990 |
| 20:16:30 | 721.500 | 7.030 | 0.970 |
| 20:17:00 | 722.000 | 7.000 | 0.940 |
| 20:17:30 | 722.500 | 6.985 | 0.925 |
| 20:18:00 | 723.000 | 6.970 | 0.910 |
| 20:18:30 | 723.500 | 6.960 | 0.900 |
| 20:19:00 | 724.000 | 6.952 | 0.892 |
| 20:19:30 | 724.500 | 6.948 | 0.888 |
| 20:20:00 | 725.000 | 6.940 | 0.880 |
| 20:21:00 | 726.000 | 6.929 | 0.869 |
| 20:23:00 | 728.000 | 6.910 | 0.850 |
| 20:24:00 | 729.000 | 6.900 | 0.840 |
| 20:25:00 | 730.000 | 6.895 | 0.835 |
| 20:26:00 | 731.000 | 6.890 | 0.830 |
| 20:27:00 | 732.000 | 6.883 | 0.823 |
| 20:28:00 | 733.000 | 6.880 | 0.820 |
| 20:29:00 | 734.000 | 6.875 | 0.815 |
| 20:30:00 | 735.000 | 6.870 | 0.810 |
| 20:35:00 | 740.000 | 6.850 | 0.790 |
| 20:45:00 | 750.000 | 6.830 | 0.770 |
| 20:50:00 | 755.000 | 6.817 | 0.757 |
| 21:00:00 | 765.000 | 6.800 | 0.740 |
| 21:05:00 | 770.000 | 6.795 | 0.735 |
| 21:20:00 | 785.000 | 6.775 | 0.715 |
| 21:30:00 | 795.000 | 6.760 | 0.700 |
| 21:40:00 | 805.000 | 6.755 | 0.695 |
| 21:50:00 | 815.000 | 6.750 | 0.690 |
| 22:00:00 | 825.000 | 6.740 | 0.680 |
| 22:15:00 | 840.000 | 6.735 | 0.675 |
| 09:00:00 | 1485.000 | 6.570 | 0.510 |
| 10:28:00 | 1573.000 | 6.450 | 0.390 |
| 17:15:00 | 1980.000 | 6.495 | 0.435 |

WELL 3-86 PUMP TEST RESPONSE IN WELL 1-86



PUMPING WELL: 3-86

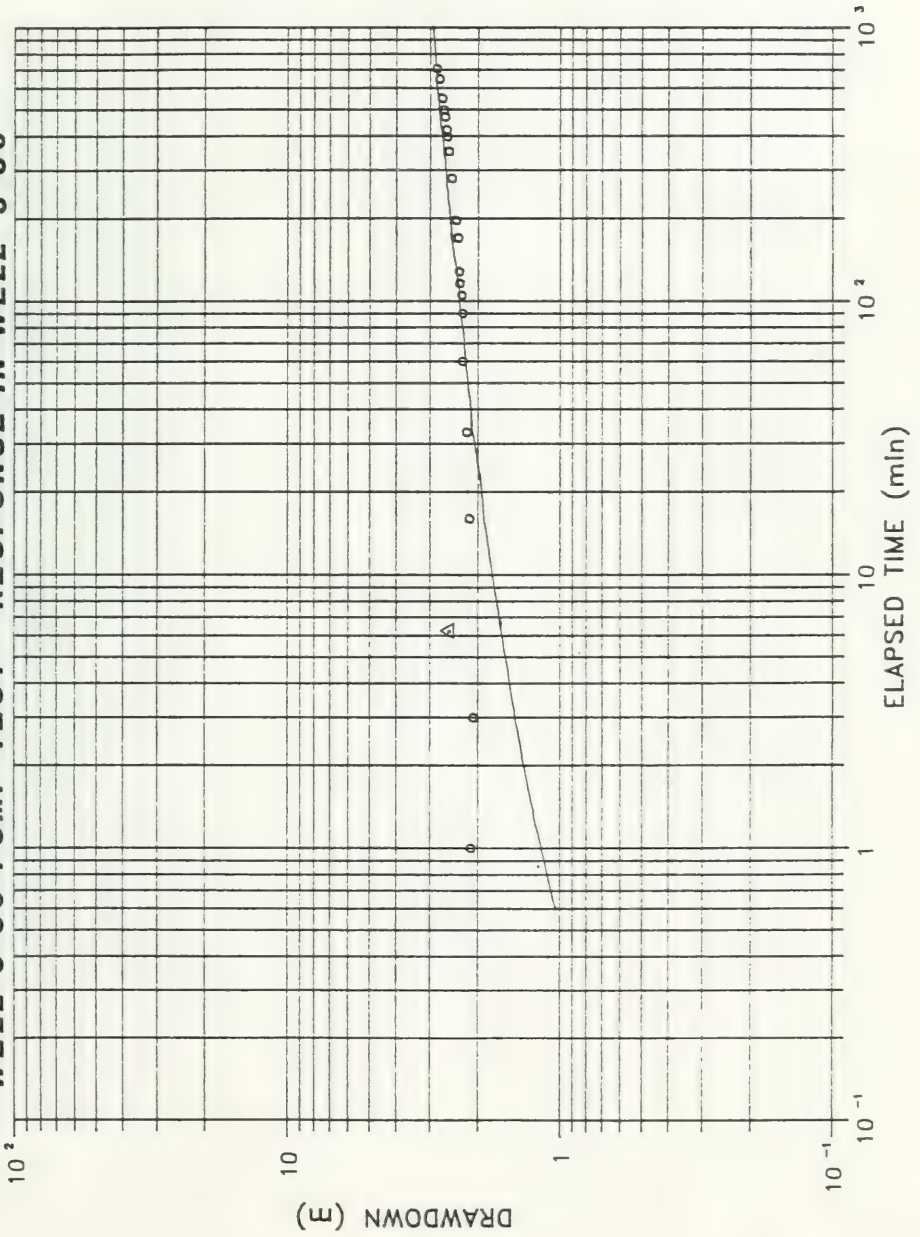
Drawdown

| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 08:15:00 | 0.000 | 5.000 | 0.000 |
| 08:16:00 | 1.000 | 7.120 | 2.120 |
| 08:18:00 | 3.000 | 7.080 | 2.080 |
| 08:31:00 | 16.000 | 7.150 | 2.150 |
| 08:48:00 | 33.000 | 7.200 | 2.200 |
| 09:15:00 | 60.000 | 7.280 | 2.280 |
| 09:45:00 | 90.000 | 7.280 | 2.280 |
| 10:00:00 | 105.000 | 7.300 | 2.300 |
| 10:11:00 | 116.000 | 7.340 | 2.340 |
| 10:23:00 | 128.000 | 7.350 | 2.350 |
| 11:05:00 | 170.000 | 7.370 | 2.370 |
| 11:32:00 | 197.000 | 7.410 | 2.410 |
| 12:55:00 | 280.000 | 7.500 | 2.500 |
| 14:06:00 | 351.000 | 7.560 | 2.560 |
| 14:53:00 | 398.000 | 7.600 | 2.600 |
| 15:17:00 | 422.000 | 7.610 | 2.610 |
| 16:05:00 | 470.000 | 7.650 | 2.650 |
| 16:33:00 | 498.000 | 7.670 | 2.670 |
| 17:25:00 | 550.000 | 7.710 | 2.710 |
| 19:03:00 | 648.000 | 7.770 | 2.770 |
| 20:02:00 | 707.000 | 7.840 | 2.840 |

Recovery

| | | | |
|----------|----------|-------|-------|
| 20:22:00 | 727.000 | 5.870 | 0.870 |
| 20:26:00 | 731.000 | 5.860 | 0.860 |
| 20:32:00 | 737.000 | 5.840 | 0.840 |
| 20:48:00 | 753.000 | 5.760 | 0.760 |
| 21:07:00 | 772.000 | 5.740 | 0.740 |
| 21:08:00 | 773.000 | 5.740 | 0.740 |
| 21:37:00 | 802.000 | 5.730 | 0.730 |
| 21:59:00 | 824.000 | 5.680 | 0.680 |
| 22:16:00 | 841.000 | 5.660 | 0.660 |
| 08:59:00 | 1484.000 | 5.500 | 0.500 |
| 10:26:00 | 1571.000 | 5.480 | 0.480 |

WELL 3-86 PUMP TEST RESPONSE IN WELL 3-86



MONITORING WELL : Victoria Park, 4-86

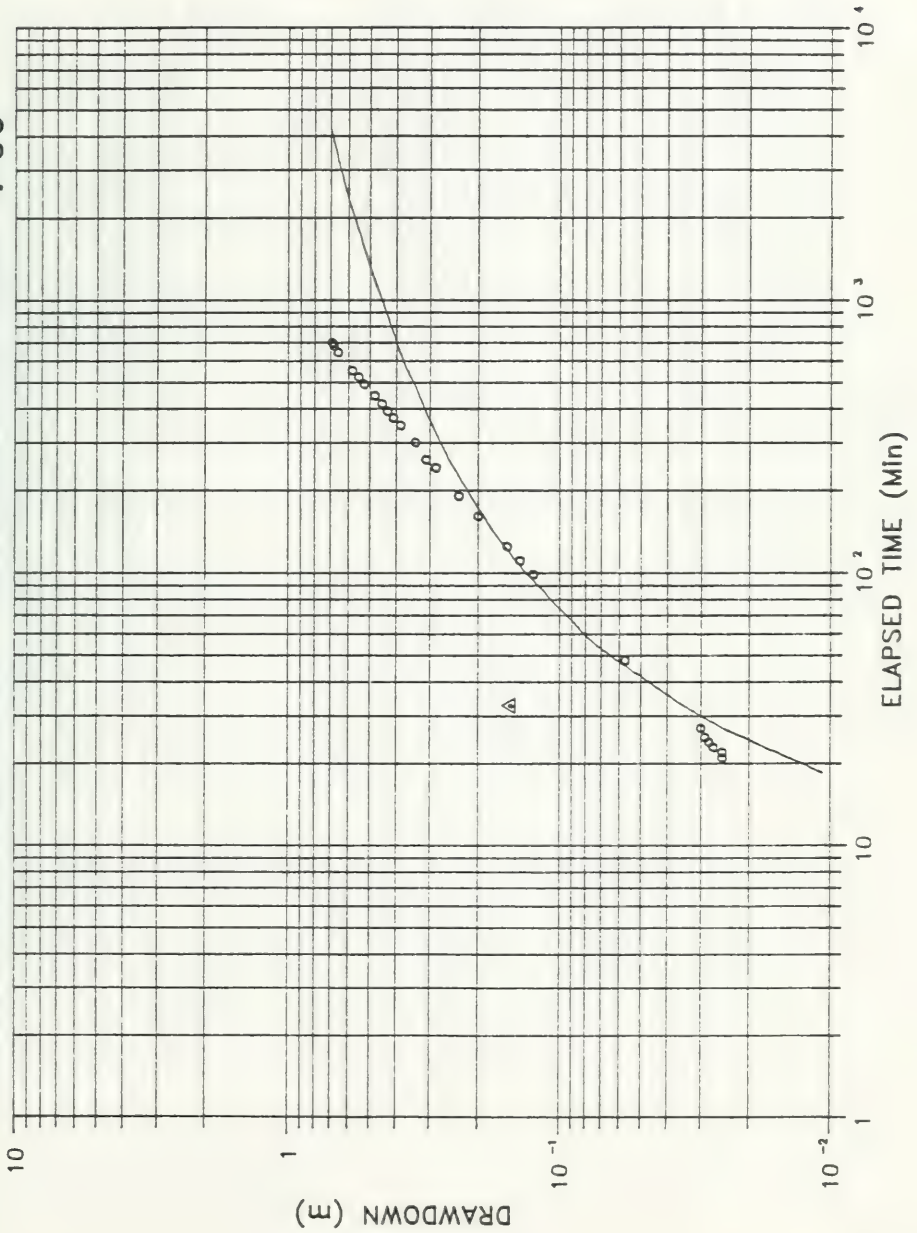
Drawdown

| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 08:15:00 | 0.000 | 5.070 | 0.000 |
| 08:36:00 | 21.000 | 5.095 | 0.025 |
| 08:37:00 | 22.000 | 5.095 | 0.025 |
| 08:38:00 | 23.000 | 5.097 | 0.027 |
| 08:39:00 | 24.000 | 5.098 | 0.028 |
| 08:40:00 | 25.000 | 5.099 | 0.029 |
| 08:42:00 | 27.000 | 5.100 | 0.030 |
| 09:03:00 | 48.000 | 5.127 | 0.057 |
| 09:54:00 | 99.000 | 5.195 | 0.125 |
| 10:06:00 | 111.000 | 5.210 | 0.140 |
| 10:20:00 | 125.000 | 5.226 | 0.156 |
| 10:56:00 | 161.000 | 5.270 | 0.200 |
| 11:26:00 | 191.000 | 5.305 | 0.235 |
| 12:18:00 | 243.000 | 5.355 | 0.285 |
| 12:35:00 | 260.000 | 5.380 | 0.310 |
| 13:16:00 | 301.000 | 5.410 | 0.340 |
| 14:03:00 | 348.000 | 5.455 | 0.385 |
| 14:26:00 | 371.000 | 5.480 | 0.410 |
| 14:47:00 | 392.000 | 5.500 | 0.430 |
| 15:13:00 | 418.000 | 5.522 | 0.452 |
| 15:42:00 | 447.000 | 5.550 | 0.480 |
| 16:28:00 | 493.000 | 5.595 | 0.525 |
| 16:59:00 | 524.000 | 5.620 | 0.550 |
| 17:29:00 | 554.000 | 5.650 | 0.580 |
| 18:59:00 | 644.000 | 5.725 | 0.655 |
| 19:36:00 | 681.000 | 5.750 | 0.680 |
| 19:54:00 | 699.000 | 5.760 | 0.690 |

Recovery

| | | | |
|----------|----------|-------|-------|
| 20:41:00 | 746.000 | 5.785 | 0.715 |
| 21:14:00 | 779.000 | 5.770 | 0.700 |
| 21:27:00 | 792.000 | 5.765 | 0.695 |
| 21:45:00 | 810.000 | 5.760 | 0.690 |
| 22:05:00 | 830.000 | 5.750 | 0.680 |
| 08:55:00 | 1480.000 | 5.590 | 0.520 |
| 16:50:00 | 1835.000 | 5.510 | 0.440 |

WELL 3-86 PUMP TEST RESPONSE IN WELL 4-86



MONITORING WELL : CN, 7-86

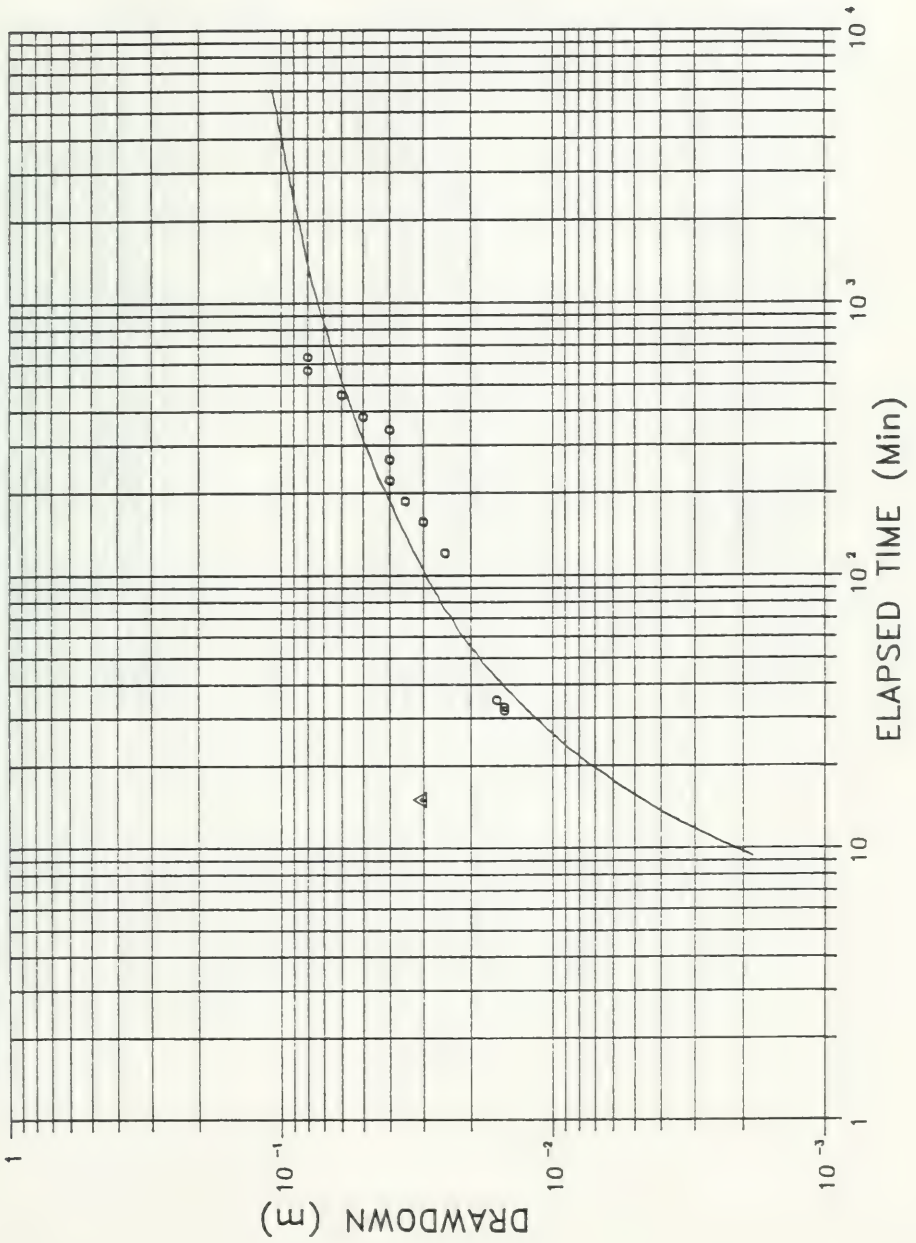
Drawdown

| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 08:15:00 | 0.000 | 5.260 | 0.000 |
| 08:47:00 | 32.000 | 5.275 | 0.015 |
| 08:48:00 | 33.000 | 5.275 | 0.015 |
| 08:50:00 | 35.000 | 5.276 | 0.016 |
| 10:16:00 | 121.000 | 5.285 | 0.025 |
| 10:52:00 | 157.000 | 5.290 | 0.030 |
| 11:22:00 | 187.000 | 5.295 | 0.035 |
| 11:58:00 | 223.000 | 5.300 | 0.040 |
| 12:41:00 | 266.000 | 5.300 | 0.040 |
| 13:58:00 | 343.000 | 5.300 | 0.040 |
| 15:37:00 | 382.000 | 5.310 | 0.050 |
| 16:55:00 | 460.000 | 5.320 | 0.060 |
| 18:43:00 | 568.000 | 5.340 | 0.080 |
| 19:50:00 | 635.000 | 5.340 | 0.080 |

Recovery

| | | | |
|----------|----------|-------|-------|
| 08:50:00 | 1475.000 | 5.370 | 0.110 |
| 16:46:00 | 1831.000 | 5.360 | 0.100 |

WELL 3-86 PUMP TEST RESPONSE IN WELL 7-86



MONITORING WELL : AQ-1b

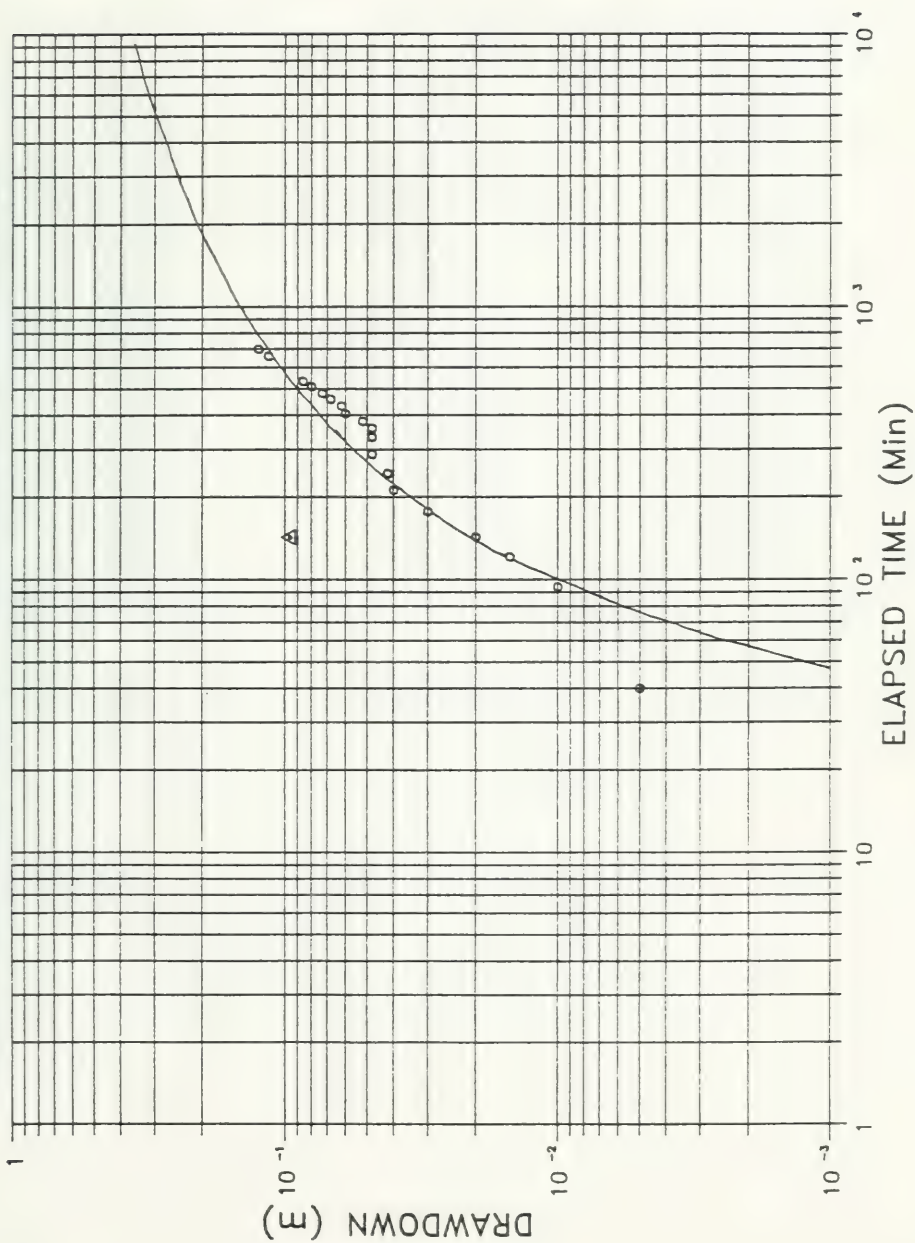
Drawdown

| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 08:15:00 | 0.000 | 2.990 | 0.000 |
| 08:30:00 | 15.000 | 2.995 | 0.005 |
| 08:55:00 | 40.000 | 2.995 | 0.005 |
| 09:49:00 | 94.000 | 3.000 | 0.010 |
| 10:16:00 | 121.000 | 3.005 | 0.015 |
| 10:38:00 | 143.000 | 3.010 | 0.020 |
| 11:12:00 | 177.000 | 3.020 | 0.030 |
| 11:47:00 | 212.000 | 3.030 | 0.040 |
| 12:29:00 | 244.000 | 3.032 | 0.042 |
| 13:02:00 | 287.000 | 3.038 | 0.048 |
| 13:47:00 | 332.000 | 3.038 | 0.048 |
| 14:13:00 | 358.000 | 3.038 | 0.048 |
| 14:35:00 | 380.000 | 3.042 | 0.052 |
| 15:00:00 | 405.000 | 3.050 | 0.060 |
| 15:27:00 | 432.000 | 3.052 | 0.062 |
| 15:53:00 | 458.000 | 3.058 | 0.068 |
| 16:15:00 | 480.000 | 3.063 | 0.073 |
| 16:44:00 | 509.000 | 3.070 | 0.080 |
| 17:08:00 | 533.000 | 3.076 | 0.086 |
| 19:14:00 | 659.000 | 3.105 | 0.115 |
| 19:55:00 | 700.000 | 3.115 | 0.125 |

Recovery

| | | | |
|----------|----------|-------|-------|
| 09:07:00 | 1492.000 | 3.235 | 0.245 |
| 16:58:00 | 1843.000 | 3.240 | 0.250 |

WELL 3-86 PUMP TEST RESPONSE IN WELL AQ1



MONITORING WELL : AQ-2

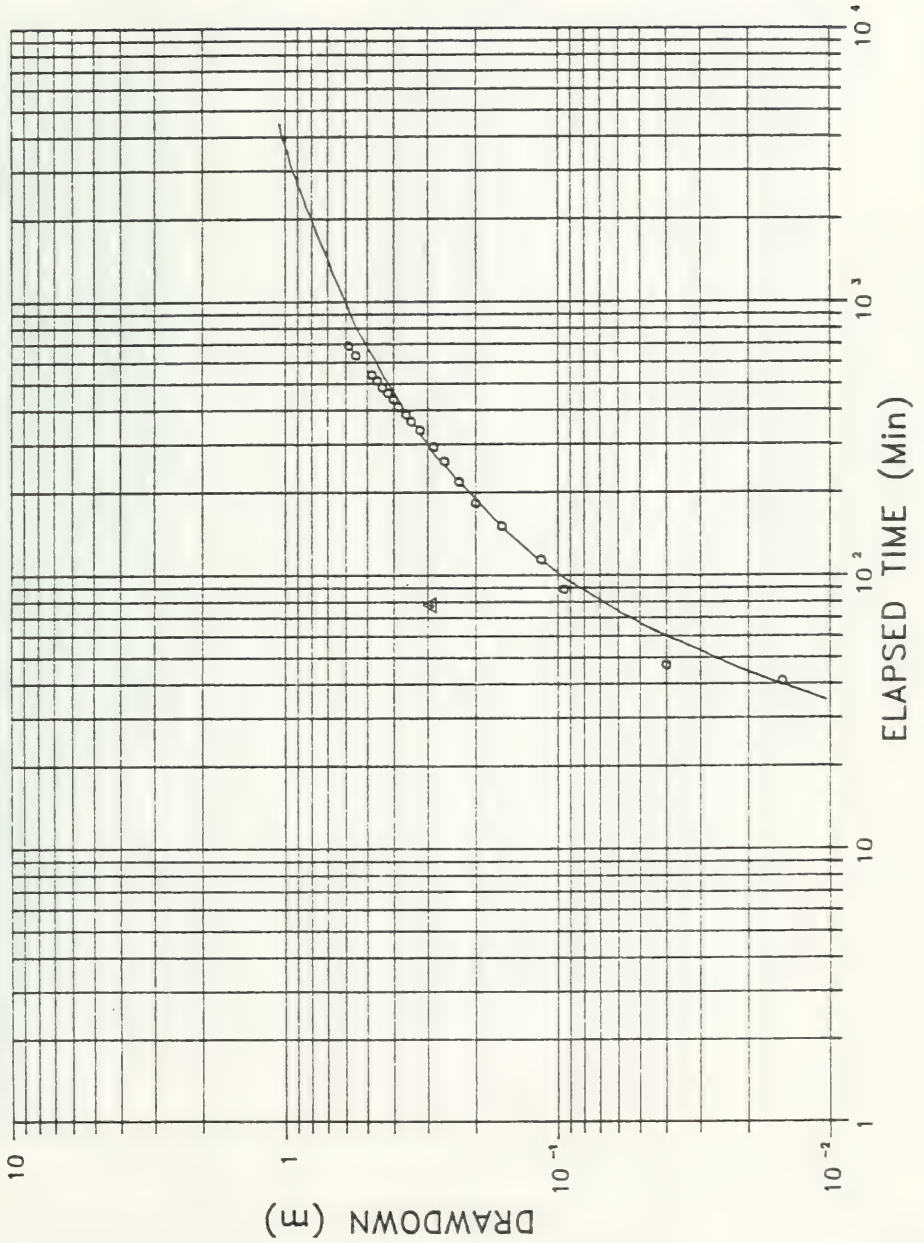
Drawdown

| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 08:15:00 | 0.000 | 5.360 | 0.000 |
| 08:36:00 | 41.000 | 5.375 | 0.015 |
| 09:02:00 | 47.000 | 5.400 | 0.040 |
| 09:44:00 | 89.000 | 5.455 | 0.095 |
| 10:09:00 | 114.000 | 5.475 | 0.115 |
| 10:46:00 | 151.000 | 5.520 | 0.160 |
| 11:18:00 | 183.000 | 5.560 | 0.200 |
| 11:54:00 | 219.000 | 5.590 | 0.230 |
| 12:35:00 | 260.000 | 5.620 | 0.260 |
| 13:09:00 | 294.000 | 5.645 | 0.285 |
| 13:53:00 | 338.000 | 5.680 | 0.320 |
| 14:19:00 | 364.000 | 5.705 | 0.345 |
| 14:41:00 | 386.000 | 5.720 | 0.360 |
| 15:07:00 | 412.000 | 5.745 | 0.385 |
| 15:33:00 | 438.000 | 5.760 | 0.400 |
| 15:59:00 | 464.000 | 5.780 | 0.420 |
| 16:20:00 | 485.000 | 5.800 | 0.440 |
| 16:50:00 | 515.000 | 5.820 | 0.460 |
| 17:15:00 | 540.000 | 5.840 | 0.480 |
| 18:51:00 | 636.000 | 5.910 | 0.550 |
| 19:47:00 | 692.000 | 5.945 | 0.585 |

Recovery

| | | | |
|----------|----------|-------|-------|
| 20:53:00 | 758.000 | 5.960 | 0.600 |
| 09:16:00 | 1501.000 | 5.820 | 0.460 |
| 17:05:00 | 1970.000 | 5.770 | 0.410 |

WELL 3-86 PUMP TEST RESPONSE IN WELL AQ2



MONITORING WELL : AQ-3

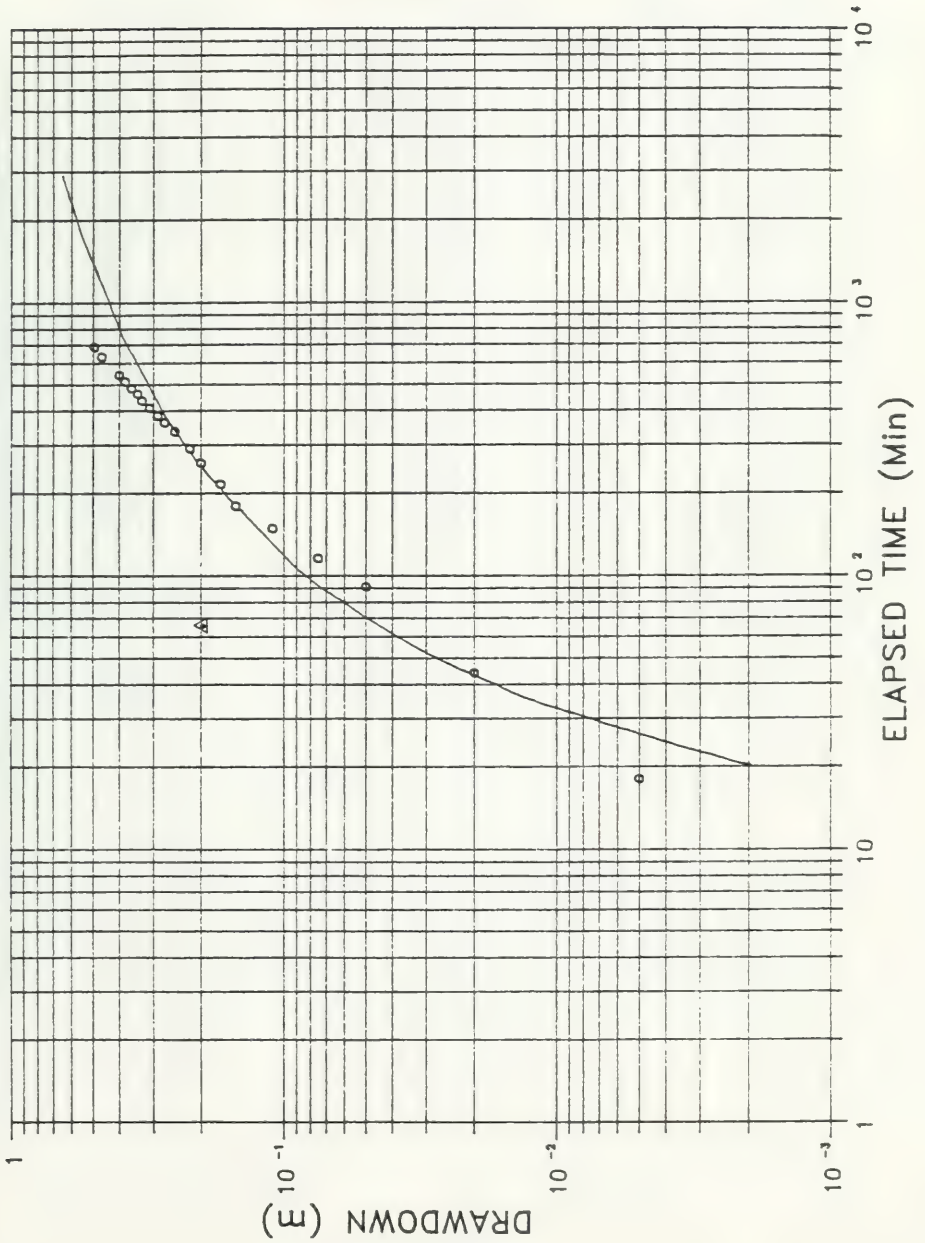
Drawdown

| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 08:15:00 | 0.000 | 5.640 | 0.000 |
| 08:33:00 | 18.000 | 5.645 | 0.005 |
| 08:59:00 | 44.000 | 5.660 | 0.020 |
| 09:46:00 | 91.000 | 5.690 | 0.050 |
| 10:11:00 | 116.000 | 5.715 | 0.075 |
| 10:44:00 | 149.000 | 5.750 | 0.110 |
| 11:15:00 | 180.000 | 5.790 | 0.150 |
| 11:51:00 | 216.000 | 5.810 | 0.170 |
| 12:33:00 | 258.000 | 5.840 | 0.200 |
| 13:06:00 | 291.000 | 5.860 | 0.220 |
| 13:51:00 | 336.000 | 5.890 | 0.250 |
| 14:17:00 | 362.000 | 5.913 | 0.273 |
| 14:39:00 | 384.000 | 5.930 | 0.290 |
| 15:05:00 | 410.000 | 5.950 | 0.310 |
| 15:31:00 | 436.000 | 5.970 | 0.330 |
| 15:57:00 | 462.000 | 5.982 | 0.342 |
| 16:19:00 | 484.000 | 6.000 | 0.360 |
| 16:48:00 | 513.000 | 6.020 | 0.380 |
| 17:17:00 | 542.000 | 6.040 | 0.400 |
| 18:48:00 | 633.000 | 6.105 | 0.465 |
| 19:42:00 | 688.000 | 6.135 | 0.495 |

Recovery

| | | | |
|----------|----------|-------|-------|
| 20:48:00 | 753.000 | 6.160 | 0.520 |
| 09:12:00 | 1497.000 | 6.075 | 0.435 |
| 17:07:00 | 1972.000 | 6.030 | 0.390 |

WELL 3-86 PUMP TEST RESPONSE IN WELL AQ3



MONITORING WELL : AQ-11

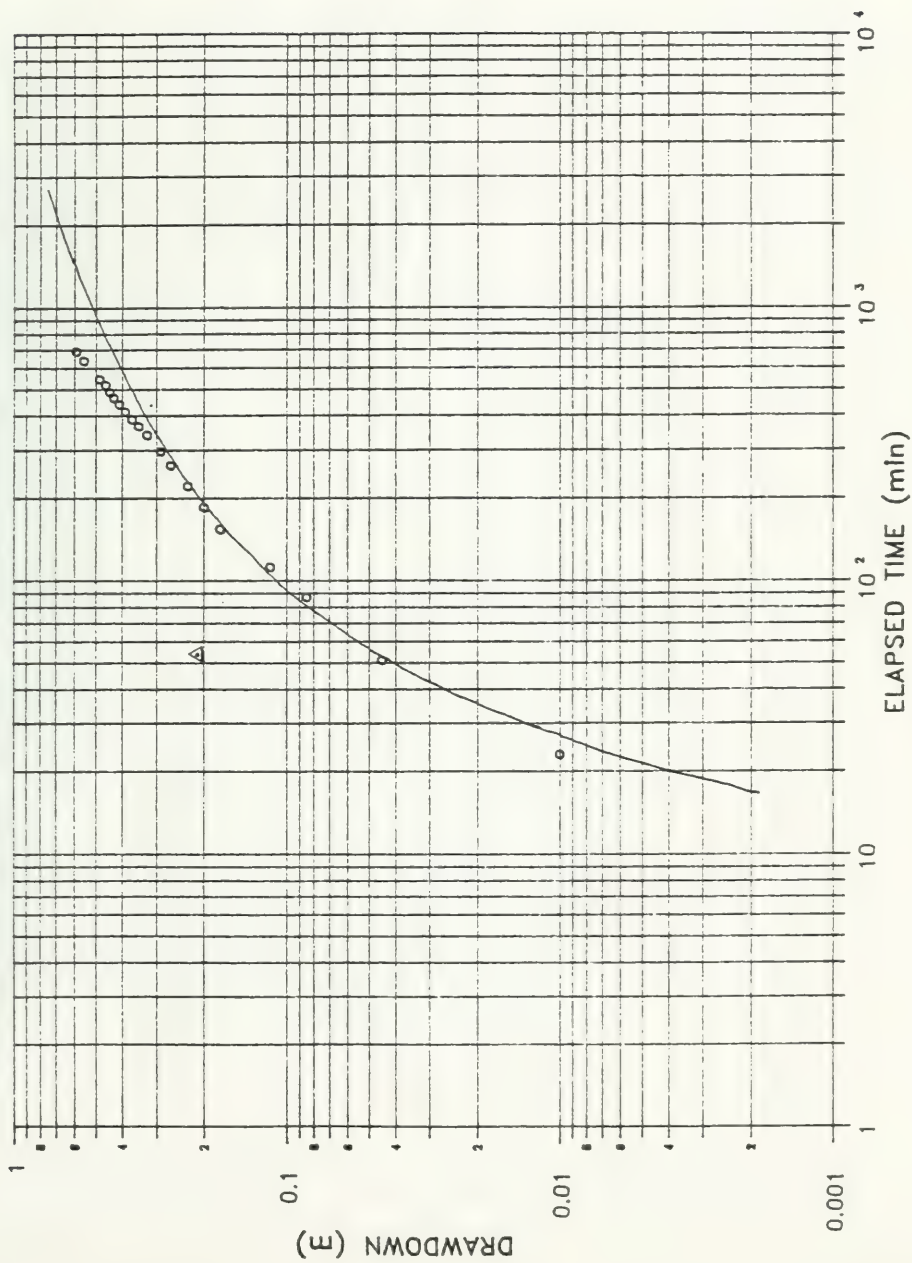
Drawdown

| Time of Reading (hr:min:sec) | Elapsed Time (min) | Water Level (m BTC) | Drawdown (metres) |
|---------------------------------|-----------------------|------------------------|----------------------|
| 08:15:00 | 0.000 | 6.020 | 0.000 |
| 08:38:00 | 23.000 | 6.030 | 0.010 |
| 09:04:00 | 51.000 | 6.065 | 0.045 |
| 09:42:00 | 87.000 | 6.105 | 0.085 |
| 10:07:00 | 112.000 | 6.135 | 0.115 |
| 10:49:00 | 154.000 | 6.195 | 0.175 |
| 11:20:00 | 185.000 | 6.220 | 0.200 |
| 11:56:00 | 221.000 | 6.250 | 0.230 |
| 12:38:00 | 263.000 | 6.286 | 0.266 |
| 13:11:00 | 296.000 | 6.310 | 0.290 |
| 13:55:00 | 340.000 | 6.345 | 0.325 |
| 14:21:00 | 366.000 | 6.368 | 0.348 |
| 14:43:00 | 388.000 | 6.388 | 0.368 |
| 15:09:00 | 414.000 | 6.410 | 0.390 |
| 15:35:00 | 440.000 | 6.430 | 0.410 |
| 16:01:00 | 466.000 | 6.450 | 0.430 |
| 16:23:00 | 488.000 | 6.465 | 0.445 |
| 16:53:00 | 518.000 | 6.480 | 0.460 |
| 17:20:00 | 545.000 | 6.505 | 0.485 |
| 18:53:00 | 638.000 | 6.575 | 0.555 |
| 19:45:00 | 690.000 | 6.610 | 0.590 |

Recovery

| | | | |
|----------|----------|-------|-------|
| 20:53:00 | 758.000 | 6.620 | 0.600 |
| 09:19:00 | 1504.000 | 6.480 | 0.460 |
| 16:10:00 | 1915.000 | 6.420 | 0.400 |

WELL 3-86 PUMP TEST RESPONSE IN WELL AQ11



APPENDIX F

Water Levels
Fresh Water Aquifer

| | | DATE MEASURED > | | Oct. 1/87 | | Oct. 4/87 | | Oct. 7/87 | |
|-----------|-----------------------|-----------------------------|-------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Well ID | Location Description | Well Elevation (m. AMSL) | Ground Elevation (m. AMSL) | Water Level (m. BTOC) | Water Level (m. AMSL) | Water Level (m. BTOC) | Water Level (m. AMSL) | Water Level (m. BTOC) | Water Level (m. AMSL) |
| 1-85 | ESSO | 181.26 | | | | | | | |
| 2-85 | Milton St. | 184.80 | | | | 1.98 | 182.82 | | |
| 3-85 | Sewage plant | 185.11 | | 4.29 | 180.82 | 4.27 | 180.84 | | |
| 4-85 | Staffhouse | 183.76 | | 5.18 | 178.58 | | | | |
| 5-85 | Hwy. 40 @ Churchill | 187.62 | | 4.33 | 183.29 | 4.41 | 183.21 | | |
| 6-85 | LaSalle Rd. | 180.00 | | 2.57 | 177.43 | | | 2.60 | 177.40 |
| 7-85 | CIL Plant | 178.91 | | | | | | | |
| 1-86 | POW Park (Deep) | 183.20 | | 6.02 | 177.18 | 6.14 | 177.06 | 6.10 | 177.10 |
| 2-86 | POW Park (Shallow) | 183.21 | | 3.35 | 179.86 | 3.39 | 179.82 | 3.37 | 179.84 |
| 3-86 | POW Park (Pumping) | 181.93 | | 4.75 | 177.18 | 4.88 | 177.05 | 4.82 | 177.11 |
| 4-86 | Victoria Park | 182.15 | | | | 5.14 | 177.01 | 5.10 | 177.05 |
| 5-86 | Huron @ Tashmo | 183.36 | | 4.15 | 179.21 | 4.19 | 179.17 | | |
| 6-86 | Sludge Lagoons | 192.00 | | | | 6.55 | 185.45 | | |
| 7-86 | CM Tunnel | 184.32 | | 5.28 | 179.04 | 5.33 | 178.99 | 5.27 | 179.05 |
| 8-86 | Hydro Tower/St.C.R.P. | 184.64 | | 6.90 | 177.74 | 6.99 | 177.65 | | |
| 1-87 | Germain Park | 183.29 | 182.58 | 1.92 | 181.36 | 2.07 | 181.22 | | |
| 2-87 | Centennial Park | 178.24 | 177.53 | 1.57 | 176.60 | 1.70 | 176.54 | 1.62 | 176.62 |
| 3-87 | Talfourd St. | 183.41 | 182.55 | 2.77 | 180.58 | 2.86 | 180.55 | 19.15 | 164.26 |
| 4-87 | Campbell @ Alice | 185.70 | 185.00 | 3.02 | 182.61 | 3.17 | 182.53 | 3.11 | 182.59 |
| 5-87 | Hwy 40 @ LaSalle | 187.96 | 187.38 | 3.82 | 184.04 | 3.87 | 184.09 | | |
| 6-87 | Guthrie Park | 181.86 | 181.11 | 4.71 | 177.08 | 4.81 | 177.05 | 4.75 | 177.11 |
| 7-87 | CR 4 @ SD 19 | 197.35 | 196.72 | 19.49 | 177.79 | 15.84 | 181.51 | 30.50 | 166.85 |
| 8-87 | LaSalle E. of Scott | 190.26 | 189.51 | 3.95 | 186.33 | 4.04 | 186.22 | 4.02 | 186.24 |
| 9-87 | Churchill E. of Plank | 191.58 | 190.66 | 4.51 | 187.01 | 4.62 | 186.96 | 4.52 | 187.06 |
| 10-87 | Air Products | 192.77 | 191.88 | 5.79 | 186.98 | 5.78 | 186.99 | 5.73 | 187.04 |
| 11-87 | Polymer Rd./S.I.R. | 182.19 | 181.49 | 5.05 | 177.09 | 5.10 | 177.09 | 5.03 | 177.16 |
| 12-87 | Polysar | 184.04 | 183.12 | 15.96 | 168.01 | 24.12 | 159.92 | | |
| 13-87 | Suncor | 184.66 | 183.77 | 6.60 | 178.06 | 6.64 | 178.02 | 6.54 | 178.12 |
| 14-87 | Hwy 40 @ Dow Brine | 192.32 | 191.61 | 7.82 | 184.42 | 7.77 | 184.55 | 7.68 | 184.64 |
| 15-87 | Dow/Churchill @ Vidal | 183.69 | 182.79 | 6.44 | 177.23 | 6.55 | 177.14 | 6.50 | 177.19 |
| ESSO | | | | | | | | | |
| AQ-1 | | 179.29 | | | | | | | |
| AQ-2 | | 182.09 | | | | | | | |
| AQ-3 | | 182.49 | | | | | | | |
| AQ-4 | | 179.27 | | | | | | | |
| AQ-6 | | 184.28 | | | | | | | |
| AQ-7 | | 190.67 | | | | | | | |
| AQ-8 | | 188.05 | | | | | | | |
| AQ-10 | | 183.34 | | | | | | | |
| AQ-11 | | 182.73 | | | | | | | |
| ST. CLAIR | | | | | | | | | |
| RIVER | | | | | | | | | |
| 1 | Point Edward, Ont. | | | | 176.37 | | 176.39 | | 176.38 |
| 2 | Port Huron, Mich. | | | | 176.33 | | 176.35 | | 176.35 |
| 3 | Marysville, Mich. | | | | 176.10 | | 176.11 | | 176.10 |

NOTE: 1) Water levels for 1985 MOE wells & 1986 Environment Canada wells are measured with respect to top of casing.
 2) Water levels for the 1987 MOE wells are measured with respect to the top of the Geoguard pump.
 3) ESSO water levels provided courtesy of Esso Petroleum Canada.

TABLE F-1 (cont'd)

SARNIA - MOE GROUNDWATER MONITORING PROGRAM
WATER LEVEL RECORD SHEET 1987

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| | | DATE MEASURED > | | Oct.14/87 | | Oct.15/87 | | Oct.16/87 | |
|-----------|-----------------------|-----------------------------|-------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|
| Well ID | Location Description | Well Elevation (m. AMSL) | Ground Elevation (m. AMSL) | Water Level Measured (m. BTOC) | Water Level Elevation (m. AMSL) | Water Level Measured (m. BTOC) | Water Level Elevation (m. AMSL) | Water Level Measured (m. BTOC) | Water Level Elevation (m. AMSL) |
| 1-85 | ESSO | 181.26 | | | | | | | |
| 2-85 | Milton St. | 184.80 | | 1.99 | 182.81 | | | 2.00 | 182.80 |
| 3-85 | Sewage plant | 185.11 | | 18.32 | 166.79 | | | | |
| 4-85 | Staffhouse | 183.76 | | | | | | | |
| 5-85 | Hwy.40 @ Churchill | 187.62 | | | | | | | |
| 6-85 | LaSalle Rd. | 180.00 | | | | | | | |
| 7-85 | CIL Plant | 178.91 | | | | | | | |
| 1-86 | POW Park (Deep) | 183.20 | | | | 6.19 | 177.01 | 6.18 | 177.02 |
| 2-86 | POW Park (Shallow) | 183.21 | | | | 3.39 | 179.82 | 7.41 | 175.80 |
| 3-86 | POW Park (Pumping) | 181.93 | | | | 4.92 | 177.01 | 4.89 | 177.04 |
| 4-86 | Victoria Park | 182.15 | | 5.18 | 176.97 | | | | |
| 5-86 | Huron @ Tashmo | 183.36 | | | | | | 4.30 | 179.06 |
| 6-86 | Sludge Lagoons | 192.00 | | | | | | | |
| 7-86 | CN Tunnel | 184.32 | | 5.40 | 178.92 | 5.39 | 178.93 | 5.37 | 178.95 |
| 8-86 | Hydro Tower/St.C.R.P. | 184.64 | | | | | | | |
| 1-87 | Germain Park | 183.29 | 182.58 | 2.10 | 181.19 | | | 2.08 | 181.21 |
| 2-87 | Centennial Park | 178.24 | 177.53 | 1.72 | 176.52 | | | 1.70 | 176.54 |
| 3-87 | Telfound St. | 183.41 | 182.55 | 2.82 | 180.59 | | | 2.83 | 180.58 |
| 4-87 | Campbell @ Alice | 185.70 | 185.00 | 3.20 | 182.50 | | | 3.18 | 182.52 |
| 5-87 | Hwy 40 @ LaSalle | 187.96 | 187.38 | | | | | | |
| 6-87 | Guthrie Park | 181.86 | 181.11 | | | | | | |
| 7-87 | CR 4 @ SD 19 | 197.35 | 196.72 | | | | | | |
| 8-87 | LaSalle E. of Scott | 190.26 | 189.51 | | | | | | |
| 9-87 | Churchill E. of Plank | 191.58 | 190.66 | | | | | | |
| 10-87 | Air Products | 192.77 | 191.88 | | | | | | |
| 11-87 | Polymer Rd./S.I.R. | 182.19 | 181.49 | | | | | | |
| 12-87 | Polysar | 184.04 | 183.12 | | | | | | |
| 13-87 | Suncor | 184.66 | 183.77 | | | | | | |
| 14-87 | Hwy 40 @ Dow Brine | 192.32 | 191.61 | | | | | | |
| 15-87 | Dow/Churchill @ Vidal | 183.69 | 182.79 | | | | | | |
| ESSO | | | | | | | | | |
| AQ-1 | | 179.29 | | | | | | | |
| AQ-2 | | 182.09 | | | | | | | |
| AQ-3 | | 182.49 | | | | | | | |
| AQ-4 | | 179.27 | | | | | | | |
| AQ-6 | | 184.28 | | | | | | | |
| AQ-7 | | 190.67 | | | | | | | |
| AQ-8 | | 188.05 | | | | | | | |
| AQ-10 | | 183.34 | | | | | | | |
| AQ-11 | | 182.73 | | | | | | | |
| ST. CLAIR | | | | | | | | | |
| RIVER | | | | | | | | | |
| 1 | Point Edward, Ont. | | | | 176.27 | | 176.30 | | 176.24 |
| 2 | Port Huron, Mich. | | | | 176.22 | | 176.25 | | 176.22 |
| 3 | Marysville, Mich. | | | | 176.00 | | 176.02 | | 175.97 |

NOTE: 1) Water levels for 1985 MOE wells & 1986 Environment Canada wells are measured with respect to top of casing.

2) Water levels for the 1987 MOE wells are measured with respect to the top of the Geoguard pump.

3) ESSO water levels provided courtesy of Esso Petroleum Canada.

TABLE F-1 (cont'd)

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SARNIA - MOE GROUNDWATER MONITORING PROGRAM
WATER LEVEL RECORD SHEET 1987

| | | DATE MEASURED > | | Oct.18/87 | | Oct.19/87 | | Oct.20/87 | |
|-----------------|-----------------------|-----------------------------|-------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|
| Well ID | Location Description | Well Elevation (m. AMSL) | Ground Elevation (m. AMSL) | Water Level Measured (m. BTOC) | Water Level Elevation (m. AMSL) | Water Level Measured (m. BTOC) | Water Level Elevation (m. AMSL) | Water Level Measured (m. BTOC) | Water Level Elevation (m. AMSL) |
| 1-85 | ESSO | 181.26 | | | | | | | |
| 2-85 | Hutton St. | 184.80 | | | | 1.98 | 182.82 | | |
| 3-85 | Sewage plant | 185.11 | | | | | | | |
| 4-85 | Staffhouse | 183.76 | | | | | | | |
| 5-85 | Hwy.40 @ Churchill | 187.62 | | 4.42 | 183.20 | 4.43 | 183.19 | | |
| 6-85 | LaSalle Rd. | 180.00 | | 2.68 | 177.32 | | | | |
| 7-85 | CIL Plant | 178.91 | | | | | | | |
| 1-86 | POW Park (Deep) | 183.20 | | | | 6.16 | 177.04 | 6.11 | 177.09 |
| 2-86 | POW Park (Shallow) | 183.21 | | | | 6.71 | 176.50 | 6.50 | 176.71 |
| 3-86 | POW Park (Pumping) | 181.93 | | | | 4.89 | 177.04 | 4.83 | 177.10 |
| 4-86 | Victoria Park | 182.15 | | | | 5.14 | 177.01 | 5.09 | 177.06 |
| 5-86 | Huron @ Tashmoo | 183.36 | | 4.26 | 179.10 | 4.23 | 179.13 | | |
| 6-86 | Sludge Lagoons | 192.00 | | 6.55 | 185.45 | | | | |
| 7-86 | CN Tunnel | 184.32 | | | | 5.35 | 178.97 | 5.30 | 179.02 |
| 8-86 | Hydro Tower/St.C.R.P. | 184.64 | | 6.94 | 177.70 | | | | |
| 1-87 | Germain Park | 183.29 | 182.58 | | | 2.08 | 181.21 | 2.02 | 181.27 |
| 2-87 | Centennial Park | 178.24 | 177.53 | | | 1.68 | 176.56 | 1.63 | 176.61 |
| 3-87 | Talfourd St. | 183.41 | 182.55 | | | 2.83 | 180.58 | 2.84 | 180.57 |
| 4-87 | Campbell @ Alice | 185.70 | 185.00 | | | 3.16 | 182.54 | 3.11 | 182.59 |
| 5-87 | Hwy 40 @ LaSalle | 187.96 | 187.38 | 3.87 | 184.09 | 3.88 | 184.08 | | |
| 6-87 | Guthrie Park | 181.86 | 181.11 | 4.82 | 177.04 | 4.84 | 177.02 | | |
| 7-87 | CR 4 @ SD 19 | 197.35 | 196.72 | 24.96 | 172.39 | 23.54 | 173.81 | | |
| 8-87 | LaSalle E. of Scott | 190.26 | 189.51 | 4.05 | 186.21 | 4.06 | 186.20 | | |
| 9-87 | Churchill E. of Plank | 191.58 | 190.66 | 4.63 | 186.95 | 4.66 | 186.92 | | |
| 10-87 | Air Products | 192.77 | 191.88 | 5.90 | 186.87 | 5.91 | 186.86 | | |
| 11-87 | Polymer Rd./S.I.R. | 182.19 | 181.49 | 5.09 | 177.10 | 5.10 | 177.09 | | |
| 12-87 | Polysar | 184.04 | 183.12 | 17.06 | 166.98 | 16.74 | 167.30 | | |
| 13-87 | Suncor | 184.66 | 183.77 | 6.57 | 178.09 | 6.53 | 178.13 | | |
| 14-87 | Hwy 40 @ Dow Brine | 192.32 | 191.61 | 7.75 | 184.57 | 7.75 | 184.57 | | |
| 15-87 | Dow/Churchill @ Vidal | 183.69 | 182.79 | 6.58 | 177.11 | 6.57 | 177.12 | | |
| ESSO | | | | | | | | | |
| AQ-1 | | 179.29 | | | | 3.06 | 176.23 | | |
| AQ-2 | | 182.09 | | | | 5.46 | 176.63 | | |
| AQ-3 | | 182.49 | | | | 5.74 | 176.75 | | |
| AQ-4 | | 179.27 | | | | | | | |
| AQ-6 | | 184.28 | | | | | | | |
| AQ-7 | | 190.67 | | | | | | | |
| AQ-8 | | 188.05 | | | | | | | |
| AQ-10 | | 183.34 | | | | | | | |
| AQ-11 | | 182.73 | | | | 6.11 | 176.62 | | |
| ST. CLAIR RIVER | | | | | | | | | |
| 1 | Point Edward, Ont. | | | | 176.31 | | 176.31 | | 176.35 |
| 2 | Port Huron, Mich. | | | | 176.28 | | 176.27 | | 176.31 |
| 3 | Marysville, Mich. | | | | 176.02 | | 176.02 | | 176.05 |

NOTE: 1) Water levels for 1985 MOE wells & 1986 Environment Canada wells are measured with respect to top of casing.
 2) Water levels for the 1987 MOE wells are measured with respect to the top of the Geoguard pump.
 3) ESSO water levels provided courtesy of Esso Petroleum Canada.

TABLE F-1 (cont'd)

SARNIA - MOE GROUNDWATER MONITORING PROGRAM 199
WATER LEVEL RECORD SHEET 1988

| Well ID | Location Description | DATE MEASURED | | Jan.19/88 | | Mar.4/88 | |
|-----------|-----------------------|------------------------|------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|
| | | Well | Ground | Water | Water | Water | Water |
| | | Elevation (m. AMSL) | Elevation (m. AMSL) | Level Measured (m. BTOC) | Level Elevation (m. AMSL) | Level Measured (m. BTOC) | Level Elevation (m. AMSL) |
| 1-85 | ESSO | 181.26 | | 4.22 | 177.04 | not meas | N/A |
| 2-85 | Mitton St. | 184.80 | | 1.84 | 182.96 | 1.83 | 182.97 |
| 3-85 | Sewage plant | 185.11 | | 20.49 | 164.62 | 24.87 | 160.24 |
| 4-85 | Staffhouse | 183.76 | | 5.32 | 178.44 | 5.28 | 178.48 |
| 5-85 | Hwy.40 @ Churchill | 187.62 | | 4.32 | 183.30 | 4.37 | 183.25 |
| 6-85 | LaSalle Rd. | 180.00 | | 2.67 | 177.34 | 2.68 | 177.32 |
| 7-85 | CIL Plant | 178.91 | | 1.32 | 177.60 | 1.28 | 177.63 |
| 1-86 | POW Park (Deep) | 183.20 | | 6.12 | 177.08 | 6.18 | 177.02 |
| 2-86 | POW Park (Shallow) | 183.21 | | 3.23 | 179.98 | 3.28 | 179.93 |
| 3-86 | POW Park (Pumping) | 181.93 | | 4.87 | 177.06 | 4.85 | 177.08 |
| 4-86 | Victoria Park | 182.15 | | 5.11 | 177.04 | 5.15 | 177.00 |
| 5-86 | Huron @ Tashmoo | 183.36 | | 4.06 | 179.30 | 4.15 | 179.21 |
| 6-86 | Sludge Lagoons | 192.00 | | 6.47 | 185.53 | 6.66 | 185.34 |
| 7-86 | CN Tunnel | 184.32 | | 5.34 | 178.98 | 5.39 | 178.93 |
| 8-86 | Hydro Tower/St.C.R.P. | 184.64 | | 7.00 | 177.64 | 7.04 | 177.60 |
| 1-87 | Germain Park | 183.29 | 182.58 | 2.03 | 181.26 | 2.10 | 181.19 |
| 2-87 | Centennial Park | 178.24 | 177.53 | 1.57 | 176.67 | 1.59 | 176.65 |
| 3-87 | Talfourd St. | 183.41 | 182.55 | 2.10 | 181.31 | 2.38 | 181.03 |
| 4-87 | Campbell @ Alice | 185.70 | 185.00 | 3.12 | 182.58 | 3.15 | 182.55 |
| 5-87 | Hwy 40 @ LaSalle | 187.96 | 187.38 | 3.81 | 184.15 | 3.83 | 184.13 |
| 6-87 | Guthrie Park | 181.86 | 181.11 | 4.81 | 177.05 | 4.86 | 177.00 |
| 7-87 | CR 4 @ SD 19 | 197.35 | 196.72 | 8.76 | 188.59 | 11.01 | 186.34 |
| 8-87 | LaSalle E. of Scott | 190.26 | 189.51 | 3.97 | 186.29 | 3.99 | 186.27 |
| 9-87 | Churchill E. of Plank | 191.58 | 190.66 | 4.44 | 187.14 | 4.33 | 187.25 |
| 10-87 | Air Products | 192.77 | 191.88 | 5.83 | 186.94 | 5.85 | 186.92 |
| 11-87 | Polymer Rd./S.I.R. | 182.19 | 181.49 | 5.07 | 177.12 | 5.10 | 177.09 |
| 12-87 | Polysar | 184.04 | 183.12 | 11.91 | 172.13 | > 24.4 | < 159.64 |
| 13-87 | Suncor | 184.66 | 183.77 | 6.55 | 178.11 | 6.47 | 178.19 |
| 14-87 | Hwy 40 @ Dow Brine | 192.32 | 191.61 | 7.66 | 184.66 | 7.74 | 184.58 |
| 15-87 | Dow/Churchill @ Vidal | 183.69 | 182.79 | 6.55 | 177.14 | 6.58 | 177.11 |
| ESSO | | | | | | | |
| AQ-1 | | 179.29 | | | 175.97 | | 175.97 |
| AQ-2 | | 182.09 | | | 176.44 | | 176.49 |
| AQ-3 | | 182.49 | | | 176.90 | | 176.59 |
| AQ-4 | | 179.27 | | | 175.89 | | 175.87 |
| AQ-6 | | 184.28 | | | 182.24 | | 182.33 |
| AQ-7 | | 190.67 | | | 186.54 | | 186.62 |
| AQ-8 | | 188.05 | | | 182.02 | | 182.09 |
| AQ-10 | | 183.34 | | | 176.63 | | 176.68 |
| AQ-11 | | 182.73 | | | 176.46 | | 176.50 |
| ST. CLAIR | | | | | | | |
| RIVER | | | | | | | |
| 1 | Point Edward, Ont. | | | | 176.17 | | 176.09 |
| 2 | Port Huron, Mich. | | | | 176.13 | | 176.06 |
| 3 | Marysville, Mich. | | | | 175.89 | | 175.83 |

NOTE: 1) Water levels for 1985 MOE wells & 1986 Environment Canada wells are measured with respect to top of casing.
 2) Water levels for the 1987 MOE wells are measured with respect to the top of the Geoguard pump.
 3) ESSO water levels provided courtesy of Esso Petroleum Canada.

TABLE F-1 (cont'd)

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SARNIA - MOE GROUNDWATER MONITORING PROGRAM
WATER LEVEL RECORD SHEET 1988

| Well ID | Location Description | DATE MEASURED | | Mar. 21/88 | | May 31/88 | |
|-----------|-----------------------|------------------------|------------------------|--------------------------------|---------------------------------|--------------------------------|---------------------------------|
| | | Well | Ground | Water | Water | Water | Water |
| | | Elevation (m. AMSL) | Elevation (m. AMSL) | Level Measured (m. BTOC) | Level Elevation (m. AMSL) | Level Measured (m. BTOC) | Level Elevation (m. AMSL) |
| 1-85 | ESSO | 181.26 | | 4.30 | 176.97 | 4.18 | 177.08 |
| 2-85 | Milton St. | 184.80 | | 1.91 | 182.89 | 1.86 | 182.94 |
| 3-85 | Sewage plant | 185.11 | | not meas | N/A | 22.60 | 162.51 |
| 4-85 | Staffhouse | 183.76 | | 5.45 | 178.31 | 5.32 | 178.44 |
| 5-85 | Hwy. 40 @ Churchill | 187.62 | | 4.45 | 183.17 | 4.36 | 183.26 |
| 6-85 | LaSalle Rd. | 180.00 | | 2.78 | 177.22 | 2.67 | 177.33 |
| 7-85 | CIL Plant | 178.91 | | 1.32 | 177.59 | 1.29 | 177.62 |
| 1-86 | POW Park (Deep) | 183.20 | | 6.22 | 176.98 | 6.09 | 177.11 |
| 2-86 | POW Park (Shallow) | 183.21 | | 3.33 | 179.88 | 3.41 | 179.80 |
| 3-86 | POW Park (Pumping) | 181.93 | | 4.95 | 176.98 | 4.83 | 177.10 |
| 4-86 | Victoria Park | 182.15 | | 5.20 | 176.95 | 5.07 | 177.08 |
| 5-86 | Huron @ Tashmo | 183.36 | | 4.18 | 179.18 | 3.92 | 179.44 |
| 6-86 | Sludge Lagoons | 192.00 | | 6.86 | 185.14 | 6.69 | 185.31 |
| 7-86 | CN Tunnel | 184.32 | | 5.42 | 178.90 | 5.29 | 179.03 |
| 8-86 | Hydro Tower/St.C.R.P. | 184.64 | | 7.13 | 177.51 | 7.02 | 177.62 |
| 1-87 | Germain Park | 183.29 | 182.58 | 2.17 | 181.12 | 2.08 | 181.21 |
| 2-87 | Centennial Park | 178.24 | 177.53 | 1.64 | 176.60 | 1.53 | 176.71 |
| 3-87 | Telford St. | 183.41 | 182.55 | 2.86 | 180.55 | 2.00 | 181.41 |
| 4-87 | Campbell @ Alice | 185.70 | 185.00 | 3.23 | 182.47 | 3.11 | 182.59 |
| 5-87 | Hwy 40 @ LaSalle | 187.96 | 187.38 | 3.93 | 184.03 | 3.82 | 184.14 |
| 6-87 | Guthrie Park | 181.86 | 181.11 | 4.95 | 176.91 | 4.82 | 177.04 |
| 7-87 | CR 4 @ SD 19 | 197.35 | 196.72 | 9.23 | 188.12 | 8.75 | 188.60 |
| 8-87 | LaSalle E. of Scott | 190.26 | 189.51 | 4.09 | 186.17 | 3.98 | 186.28 |
| 9-87 | Churchill E. of Plank | 191.58 | 190.66 | 4.55 | 187.03 | 4.43 | 187.15 |
| 10-87 | Air Products | 192.77 | 191.88 | 5.96 | 186.81 | 5.83 | 186.94 |
| 11-87 | Polymer Rd./S.I.R. | 182.19 | 181.49 | 5.17 | 177.03 | 5.05 | 177.14 |
| 12-87 | Polysar | 184.04 | 183.12 | 18.46 | 165.58 | 15.75 | 168.29 |
| 13-87 | Suncor | 184.66 | 183.77 | 6.83 | 177.83 | 6.61 | 178.05 |
| 14-87 | Hwy 40 @ Dow Brine | 192.32 | 191.61 | 7.79 | 184.53 | 7.67 | 184.65 |
| 15-87 | Dow/Churchill @ Vidal | 183.69 | 182.79 | 6.64 | 177.05 | 6.52 | 177.17 |
| ESSO | | | | | | | |
| AQ-1 | | 179.29 | | | 175.86 | | 176.03 |
| AQ-2 | | 182.09 | | | 176.41 | | 176.54 |
| AQ-3 | | 182.49 | | | 176.51 | | 176.62 |
| AQ-4 | | 179.27 | | | 175.82 | | 175.87 |
| AQ-6 | | 184.28 | | | 182.22 | | 182.33 |
| AQ-7 | | 190.67 | | | 186.61 | | 186.61 |
| AQ-8 | | 188.05 | | | 181.99 | | 182.09 |
| AQ-10 | | 183.34 | | | 176.60 | | 176.71 |
| AQ-11 | | 182.73 | | | 176.42 | | 176.54 |
| ST. CLAIR | | | | | | | |
| RIVER | | | | | | | |
| 1 | Point Edward, Ont. | | | | 176.16 | | 176.23 |
| 2 | Port Huron, Mich. | | | | 176.12 | | 176.19 |
| 3 | Marysville, Mich. | | | | 175.86 | | 175.95 |

NOTE: 1) Water levels for 1985 MOE wells & 1986 Environment Canada wells are measured with respect to top of casing.

2) Water levels for the 1987 MOE wells are measured with respect to the top of the Geoguard pump.

3) ESSO water levels provided courtesy of Esso Petroleum Canada

APPENDIX G

Groundwater Chemistry
Fresh Water Aquifer

INDEX FOR QA/QC SAMPLES

Fresh Water Aquifer

| Sample Identification | Sample Description |
|--------------------------------|---|
| 87-39-01 | Water rinse of drill equipment prior to drilling 87 series wells |
| P8-86 | Distilled water rinse of sampling pump installed in well 8-86 |
| P10-87-BL | Distilled water rinse of sampling pump installed in well 10-87 |
| P10-87-BLF | Distilled water rinse of sampling pump installed in well 10-87 and filtering unit |
| CITYW | City of Sarnia drinking water |
| DIW | Distilled water - first sampling round |
| MSMW-16-87 (Second Quarter) | Distilled water rinse of filtering unit, second sampling round |
| MSMW-16-87 (Third Quarter) | Distilled water rinse of filtering unit, third sampling round |

APPENDIX G1

Fresh Water Aquifer
Field pH, Conductivity, Major Ions, and Total Phenols

Analyzed by:
Ontario Ministry of the Environment
London, Ontario

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | | | |
|------------------------------------|------------------------|--------------------------------|-------------------|-------------------|-------------------|-------------------|
| | 1-85 1st Round | 1-85 1st Round Duplicate | 1-85 2nd Round | 1-85 3rd Round | 3-85 2nd Round | 3-85 3rd Round |
| pH | 7.65 1895 | 7.65 1895 | 7.70 1810 | 7.70 --- | 13.5 3990 | 12.2 --- |
| Conductivity (umhos) | | | | | | |
| Alkalinity (as CaCO ₃) | 170 | 166 | 164 | 167 | 712 | 826 |
| Chloride | 745 | 740 | 713 | 819 | 286 | 312 |
| Fluoride | 1.3 | 1.3 | 1.4 | 1.4 | 0.6 | 0.6 |
| Ammonia (as N) | 0.75 | 0.63 | 0.71 | 0.69 | 2.6 | 2.8 |
| Nitrate (as N) | 0.4 | 0.3 | <0.1 | <0.1 | <0.1 | 0.1 |
| Sulphate | 2.5 | 2.5 | 2.5 | 2.5 | 10.5 | 12.0 |
| Phenols (ug·L ⁻¹) | <1.0 | <1.0 | <1.0 | <1.0 | 4.0 | 3.5 |
| Calcium | 92 | 92 | 86 | 81 | 265 | 121 |
| Magnesium | 26 | 27 | 24 | 25 | 0.1 | 0.2 |
| Calculated Hardness | 338 | 339 | 311 | 305 | 663 | 304 |
| Sodium | 405 | 409 | 407 | 400 | 272 | 282 |
| Potassium | 5.8 | 5.8 | 6.2 | 6.0 | 8.3 | 7.6 |
| Iron | 0.96 | 0.59 | 0.74 | 0.73 | 0.01 | 0.01 |
| Manganese | 0.03 | 0.04 | 0.03 | 0.03 | 0.01 | 0.001 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | | |
|------------------------------------|------------------------|-------------------|--------------------------------|-------------------|--|
| | 4-85 1st Round | 4-85 2nd Round | 4-85 2nd Round Duplicate | 4-85 3rd Round | 6-85 1st Round 6-85 2nd Round |
| pH | 8.03* | 7.93 | 7.93 | 7.75 | 7.45 7.34 |
| Conductivity (umhos) | --- | 1910 | 1910 | --- | 3300 3030 |
| Alkalinity (as CaCO ₃) | 382 | 394 | 382 | 395 | 289 303 |
| Chloride | 722 | 702 | 682 | 509 | 1654 1400 |
| Fluoride | 1.4 | 1.5 | 1.5 | 1.6 | 0.8 0.9 |
| Ammonia (as N) | 0.34 | 0.43 | 0.43 | 0.36 | 0.79 0.81 |
| Nitrate (as N) | <0.1 | <0.1 | <0.1 | 0.1 | 0.4 <0.1 |
| Sulphate | 3.0 | 2.5 | 2.5 | 3.0 | 3.5 4.0 |
| Phenols (ug·L ⁻¹) | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 <1.0 |
| Calcium | 16 | 128 | 13.2 | 17.1 | 80 62 |
| Magnesium | 4.6 | 4.4 | 4.5 | 4.3 | 20 20 |
| Calculated Hardness | 60 | 50 | 51 | 60.3 | 283 237 |
| Sodium | 554 | 610 | 632 | 408 | 952 885 |
| Potassium | 3.2 | 2.9 | 2.9 | 4.8 | 6.3 6.0 |
| Iron | 0.13 | 0.02 | 0.01 | 0.03 | 0.84 0.21 |
| Manganese | 0.01 | 0.01 | 0.01 | 0.01 | 0.07 0.08 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | | | |
|------------------------------------|------------------------|--------------------------------|-------------------|--------------------------------|-------------------|--------------------------------|
| | 6-85 3rd Round | 6-85 3rd Round Duplicate | 7-85 1st Round | 7-85 1st Round Duplicate | 7-85 2nd Round | 7-85 3rd Round Duplicate |
| pH | 7.40 | 7.82 | 8.0* | 8.07* | 8.37 | 8.08* |
| Conductivity (umhos) | --- | --- | --- | --- | 3610 | 5800* |
| Alkalinity (as CaCO ₃) | 315 | 292 | 121 | 87 | 83 | 88 |
| Chloride | 1668 | 1765 | 1625 | 1842 | 1837 | 1741 |
| Fluoride | 0.9 | 1.0 | 0.9 | 0.9 | 0.9 | 0.9 |
| Ammonia (as N) | 0.80 | 0.82 | 0.91 | 0.94 | 0.96 | 0.89 |
| Nitrate (as N) | 0.1 | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Sulphate | 4.5 | 4.5 | 5.5 | 5.5 | 5.0 | 5.5 |
| Phenols (ug·L ⁻¹) | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calcium | 76 | 77 | 79 | 79 | 80 | 75 |
| Magnesium | 21 | 21 | 25 | 25 | 25 | 26 |
| Calculated Hardness | 275 | 277 | 299 | 301 | 306 | 295 |
| Sodium | 868 | 910 | 980 | 1065 | 1034 | 1070 |
| Potassium | 6.2 | 6.3 | 7.0 | 6.9 | 6.7 | 6.7 |
| Iron | 0.68 | 0.66 | 0.04 | 0.04 | 0.01 | <0.01 |
| Manganese | 0.08 | 0.08 | 0.03 | 0.02 | 0.02 | 0.02 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter ($\text{mg}\cdot\text{L}^{-1}$) | Monitoring Well Sample | | | |
|--|------------------------|-------------------|-------------------|---|
| | 1-86 1st Round | 1-86 2nd Round | 1-86 3rd Round | 1-86 1st Round 4-86 1st Round 2nd Round |
| pH | | | | |
| Conductivity (umhos) | 7.51 1190 | 7.90 1110 | 7.66 1590* | 7.51 1450 7.61 1775 7.83 1650 |
| Alkalinity (as CaCO_3) | | | | |
| Chloride | 162 | 168 | 168 | 157 |
| Fluoride | 429 | 375 | 363 | 598 |
| Ammonia (as N) | 1.3 | 1.3 | 1.3 | 1.2 |
| Nitrate (as N) | 0.55 | 0.62 | 0.55 | 0.67 |
| Sulphate | 0.4 | <0.1 | <0.1 | 0.3 |
| | 2.0 | 2.0 | 2.0 | 2.0 |
| Phenols ($\text{ug}\cdot\text{L}^{-1}$) | <1.0 | <1.0 | <1.0 | 2.5 <1.0 |
| Calcium | 64 | 44 | 50 | 78 |
| Magnesium | 16 | 14 | 14 | 20 |
| Calculated Hardness | 225 | 168 | 182 | 276 |
| Sodium | 243 | 245 | 250 | 306 |
| Potassium | 4.7 | 4.3 | 4.3 | 5.3 |
| Iron | 0.98 | 0.01 | 0.01 | 0.46 |
| Manganese | 0.02 | 0.04 | 0.04 | 0.04 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | | | |
|------------------------------------|------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | 4-86 3rd Round | 5-86 1st Round | 5-86 2nd Round | 5-86 3rd Round | 6-86 1st Round | 6-86 2nd Round |
| pH | 7.66 | 8.10 | 7.86 | 8.07 | 7.88 | 7.66 |
| Conductivity (umhos) | --- | 900 | 910 | --- | 1050 | 1030 |
| Alkalinity (as CaCO ₃) | 151 | 258 | 253 | 257 | 210 | 229 |
| Chloride | 719 | 259 | 246 | 296 | 311 | 317 |
| Fluoride | 1.3 | 1.4 | 1.4 | 1.5 | 1.0 | 1.0 |
| Ammonia (as N) | 0.61 | 0.21 | 0.31 | 0.24 | 0.33 | 0.34 |
| Nitrate (as N) | <0.1 | 0.1 | <0.1 | 0.1 | 0.4 | <0.1 |
| Sulphate | 2.5 | 2.0 | 1.5 | 2.0 | 1.5 | 1.0 |
| Phenols (ug·L ⁻¹) | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calcium | 74 | 16 | 17 | 15 | 35 | 27 |
| Magnesium | 21 | 4.6 | 4.7 | 4.9 | 10 | 9.3 |
| Calculated Hardness | 270 | 59 | 61 | 58 | 130 | 106 |
| Sodium | 357 | 249 | 253 | 255 | 261 | 246 |
| Potassium | 5.1 | 2.0 | 2.4 | 2.1 | 2.3 | 2.0 |
| Iron | 1.2 | 0.27 | 0.01 | 0.01 | 0.40 | 0.01 |
| Manganese | 0.09 | 0.01 | 0.01 | 0.01 | 0.02 | 0.03 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | | | |
|------------------------------------|------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | 6-86 3rd Round | 7-86 1st Round | 7-86 2nd Round | 7-86 3rd Round | 8-86 1st Round | 8-86 2nd Round |
| pH | 7.98 | 7.59 | 8.19 | 7.91 | 8.00 | 7.94 |
| Conductivity (umhos) | 1500* | 600 | 515 | --- | 1000 | 1010 |
| Alkalinity (as CaCO ₃) | 216 | 191 | 210 | 200 | 289 | 291 |
| Chloride | 319 | 149 | 135 | 146 | 291 | 317 |
| Fluoride | 1.0 | 1.2 | 1.4 | 1.4 | 1.6 | 1.7 |
| Ammonia (as N) | 0.34 | 0.29 | 0.35 | 0.25 | 0.04 | 0.32 |
| Nitrate (as N) | <0.1 | 0.4 | <0.1 | <0.1 | 0.4 | <0.1 |
| Sulphate | 3.0 | 2.5 | 1.0 | 2.5 | 1.0 | 3.0 |
| Phenols (ug·L ⁻¹) | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calcium | 28 | 30 | 22 | 28 | 14 | 9.5 |
| Magnesium | 9.6 | 11 | 11 | 12 | 4.1 | 3.3 |
| Calculated Hardness | 108 | 121 | 100 | 117 | 53 | 38 |
| Sodium | 274 | 118 | 129 | 124 | 285 | 327 |
| Potassium | 2.0 | 3.3 | 2.9 | 3.0 | 1.8 | 1.7 |
| Iron | 0.05 | 0.12 | <0.01 | 0.01 | 0.12 | 0.01 |
| Manganese | 0.02 | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter ($\text{mg}\cdot\text{L}^{-1}$) | Monitoring Well Sample | | | | |
|--|------------------------|-------------------|-------------------|-------------------|--|
| | 8-86 3rd Round | 1-87 1st Round | 1-87 2nd Round | 1-87 3rd Round | 2-87 1st Round 2-87 2nd Round |
| pH | 8.10 | 7.83 | 8.14 | 7.78 | 7.53 7.72 |
| Conductivity (umhos) | --- | 1050 | 1090 | 1430* | 2675 2360 |
| Alkalinity (as CaCO_3) | 285 | + | 259 | 259 | 160 181 |
| Chloride | 359 | 310 | 293 | 283 | 1031 1076 |
| Fluoride | 1.8 | 1.3 | 1.4 | 1.3 | 0.7 0.9 |
| Ammonia (as N) | 0.26 | + | 0.36 | 0.35 | 1.1 0.96 |
| Nitrate (as N) | 0.1 | + | <0.1 | <0.1 | 0.4 <0.1 |
| Sulphate | 2.0 | + | 5.0 | 3.0 | 16 4.0 |
| Phenols ($\text{ug}\cdot\text{L}^{-1}$) | <1.0 | + | 5.5 | 1.5 | <1.0 <1.0 |
| Calcium | 12 | + | 15 | 19 | 107 87 |
| Magnesium | 3.6 | + | 6.6 | 6.7 | 33 33 |
| Calculated Hardness | 45 | + | 66 | 75 | 405 355 |
| Sodium | 316 | 257 | 266 | 284 | 615 580 |
| Potassium | 2.0 | 2.4 | 2.2 | 2.2 | 20 5.4 |
| Iron | 0.13 | 0.02 | 0.02 | 0.05 | 0.24 0.24 |
| Manganese | 0.01 | 0.02 | 0.01 | 0.01 | 0.08 0.06 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter ($\text{mg}\cdot\text{L}^{-1}$) | Monitoring Well Sample | | | | |
|--|--------------------------------|-------------------|--------------------------------|-------------------|--------------------------------|
| | 2-87 2nd Round Duplicate | 2-87 3rd Round | 2-87 3rd Round Duplicate | 3-87 1st Round | 3-87 2nd Round 3rd Round |
| pH | 7.72 | 7.57 | 7.57 | 7.75 | 8.17 |
| Conductivity (μmhos) | 2360 | --- | --- | 1300 | 995 |
| Alkalinity (as CaCO_3) | 181 | 176 | 174 | 543 | 489 |
| Chloride | 1011 | 1216 | 1247 | 216 | 227 |
| Fluoride | 0.8 | 0.8 | 0.8 | 0.7 | 1.0 |
| Ammonia (as N) | 0.96 | 0.84 | 0.87 | 0.24 | 0.13 |
| Nitrate (as N) | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Sulphate | 3.5 | 3.5 | 3.5 | 4.5 | 2.5 |
| Phenols ($\mu\text{g}\cdot\text{L}^{-1}$) | <1.0 | <1.0 | <1.0 | <1.0 | 22.5 |
| Calcium | 88 | 99 | 98 | 34 | 34 |
| Magnesium | 33 | 34 | 34 | 10 | 9.5 |
| Calculated Hardness | 354 | 388 | 387 | 127 | 124 |
| Sodium | 574 | 580 | 570 | 310 | 322 |
| Potassium | 5.2 | 5.3 | 5.3 | 3.3 | 7.0 |
| Iron | 0.29 | 0.45 | 0.65 | 0.35 | 0.07 |
| Manganese | 0.05 | 0.05 | 0.06 | 0.03 | 0.02 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter ($\text{mg}\cdot\text{L}^{-1}$) | Monitoring Well Sample | | | | | |
|--|------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | 4-87 1st Round | 4-87 2nd Round | 4-87 3rd Round | 5-87 1st Round | 5-87 2nd Round | 5-87 3rd Round |
| pH | 7.70 | 8.05 | 8.01 | 8.09 | 8.17 | 7.83 |
| Conductivity (μmhos) | 875 | 1010 | 1480* | 1725 | 1910 | --- |
| Alkalinity (as CaCO_3) | | | | | | |
| Chloride | + | 306 | 224 | + | 307 | 314 |
| Fluoride | 355 | 1337 | 330 | 558 | 614 | 728 |
| Ammonia (as N) | 1.1 | 0.9 | 1.1 | 1.0 | 1.0 | 1.1 |
| Nitrate (as N) | + | 0.82 | 0.35 | + | 0.41 | 0.29 |
| Sulphate | + | <0.1 | <0.1 | + | 0.1 | <0.1 |
| | 3.5 | 4.0 | 2.5 | 5.5 | 4.5 | 4.0 |
| Phenols ($\mu\text{g}\cdot\text{L}^{-1}$) | + | 10.5 | <1.0 | + | <1.0 | <1.0 |
| Calcium | + | 63 | 19 | + | 28 | 27 |
| Magnesium | + | 20 | 6.8 | + | 8.6 | 8.4 |
| Calculated Hardness | + | 238 | 76 | + | 106 | 103 |
| Sodium | 284 | 905 | 286 | 471 | 474 | 473 |
| Potassium | 2.8 | 6.1 | 4.4 | 3.9 | 4.5 | 6.1 |
| Iron | 0.02 | 0.29 | 0.01 | 0.03 | <0.01 | 0.01 |
| Manganese | 0.02 | 0.07 | 0.01 | 0.02 | 0.02 | 0.02 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter ($\text{mg}\cdot\text{L}^{-1}$) | Monitoring Well Sample | | | | |
|--|------------------------|-------------------|--------------------------------|-------------------|--|
| | 6-87 1st Round | 6-87 2nd Round | 6-87 2nd Round Duplicate | 6-87 3rd Round | 7-87 1st Round 7-87 2nd Round |
| pH | 8.20 | 8.05 | 8.05 | 8.26 | 11.78 |
| Conductivity (μmhos) | 1270 | 1190 | 1190 | --- | 1710 |
| Alkalinity (as CaCO_3) | | | | | |
| Chloride | + | 297 | 303 | 291 | 393 |
| Fluoride | 372 | 390 | 382 | 409 | 311 |
| Ammonia (as N) | 1.6 | 1.7 | 1.7 | 1.8 | 1.6 |
| Nitrate (as N) | + | 0.34 | 0.34 | 0.24 | + |
| Sulphate | + | 0.1 | 0.2 | <0.1 | <0.1 |
| | 3.5 | 6.0 | 5.0 | 4.5 | 26.5 |
| Phenols ($\mu\text{g}\cdot\text{L}^{-1}$) | + | <1.0 | <1.0 | <1.0 | 1.5 |
| Calcium | + | 13 | 12 | 11 | 50 |
| Magnesium | + | 4.1 | 4.2 | 4.3 | 0.5 |
| Calculated Hardness | + | 49 | 48 | 46 | 128 |
| Sodium | + | 352 | 365 | 346 | 257 |
| Potassium | + | 4.4 | 4.4 | 10.0 | 160 |
| Iron | + | <0.01 | <0.01 | 2.0 | 0.14 |
| Manganese | + | 0.01 | 0.01 | 0.04 | <0.001 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | | |
|------------------------------------|------------------------|-------------------|-------------------|-------------------|--------------------------------|
| | 7-87 3rd Round | 8-87 1st Round | 8-87 2nd Round | 8-87 3rd Round | 9-87 1st Round Duplicate |
| pH | 11.82 | 8.00 | 7.74 | 7.78 | 7.42 |
| Conductivity (umhos) | --- | 1700 | 1610 | 2510* | 910 |
| Alkalinity (as CaCO ₃) | 206 | + | 237 | 238 | 362 |
| Chloride | 398 | 631 | 623 | 651 | 196 |
| Fluoride | 1.4 | 1.1 | 1.1 | 1.1 | 1.2 |
| Ammonia (as N) | 0.50 | + | 0.40 | 0.37 | 0.23 |
| Nitrate (as N) | 0.1 | + | <0.1 | <0.1 | 0.3 |
| Sulphate | 8.5 | 9.5 | 1.5 | 3.0 | 4.5 |
| Phenols (ug·L ⁻¹) | <1.0 | + | <1.0 | <1.0 | <1.0 |
| Calcium | 5.7 | + | 30 | 28 | 24 |
| Magnesium | 0.2 | + | 9.8 | 9.7 | 8.9 |
| Calculated Hardness | 15 | + | 114 | 110 | 90 |
| Sodium | 262 | 462 | 457 | 495 | 246 |
| Potassium | 105 | 3.0 | 2.9 | 7.1 | 2.1 |
| Iron | 0.01 | 0.17 | 0.01 | 0.06 | 0.24 |
| Manganese | 0.001 | 0.02 | 0.02 | 0.02 | 0.02 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | | | |
|------------------------------------|------------------------|-------------------|--------------------|--------------------|--------------------|--------------------|
| | 9-87 2nd Round | 9-87 3rd Round | 10-87 1st Round | 10-87 2nd Round | 10-87 3rd Round | 11-87 1st Round |
| pH | 7.79 | 7.61 | 7.58 | 7.78 | 7.74 | 8.25 |
| Conductivity (umhos) | 900 | --- | 680 | 650 | 950* | 990 |
| Alkalinity (as CaCO ₃) | 354 | 362 | 239 | 270 | 256 | 310 |
| Chloride | 201 | 295 | 163 | 194 | 161 | 240 |
| Fluoride | 1.2 | 1.2 | 1.2 | 1.3 | 1.2 | 1.8 |
| Ammonia (as N) | 0.32 | 0.25 | 0.21 | 0.23 | 0.27 | 0.06 |
| Nitrate (as N) | <0.1 | <0.1 | 0.4 | <0.1 | <0.1 | 0.4 |
| Sulphate | 2.5 | 2.0 | 3.5 | 1.0 | 2.0 | 2.5 |
| Phenols (ug·L ⁻¹) | 10.5 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calcium | 18 | 25 | 20 | 20 | 19 | 14 |
| Magnesium | 7.8 | 9.1 | 6.9 | 6.9 | 7.0 | 4.1 |
| Calculated Hardness | 76 | 99 | 80 | 77 | 76 | 51 |
| Sodium | 242 | 264 | 140 | 163 | 186 | 285 |
| Potassium | 1.9 | 2.2 | 5.0 | 2.1 | 5.6 | 4.0 |
| Iron | 0.02 | 0.31 | 0.11 | <0.01 | 0.01 | 0.19 |
| Manganese | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | | | |
|------------------------------------|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | 11-87 2nd Round | 11-87 3rd Round | 12-87 1st Round | 12-87 2nd Round | 12-87 3rd Round | 13-87 1st Round |
| pH | 7.90 | 8.25 | 12.67* | 12.16 | 12.09 | 7.89 |
| Conductivity (umhos) | 995 | --- | 7000 | 5100 | --- | 950 |
| Alkalinity (as CaCO ₃) | 319 | 322 | 1152 | 954 | 670 | 245 |
| Chloride | 261 | 447 | 269 | 473 | 691 | 265 |
| Fluoride | 1.9 | 2.0 | 1.6 | 1.6 | 1.4 | 1.7 |
| Ammonia (as N) | 0.33 | 0.34 | + | 2.0 | 1.9 | 0.01 |
| Nitrate (as N) | 0.2 | 0.1 | <0.1 | <0.1 | <0.1 | 0.4 |
| Sulphate | 2.5 | 2.0 | 21 | 12 | 9.0 | 5.0 |
| Phenols (ug·L ⁻¹) | 13.5 | <1.0 | 4.0 | 4.0 | 2.5 | 3.0 |
| Calcium | 12 | 11 | 214 | 140 | 110 | 15 |
| Magnesium | 4.2 | 4.0 | 0.4 | 0.2 | 0.3 | 3.8 |
| Calculated Hardness | 47 | 44 | 537 | 350 | 275 | 52 |
| Sodium | 283 | 312 | 480 | 499 | 559 | 270 |
| Potassium | 2.5 | 3.6 | 426 | 277 | 206 | 2.9 |
| Iron | 0.02 | <0.01 | 0.04 | <0.01 | 0.01 | 0.03 |
| Manganese | 0.005 | 0.003 | 0.002 | <0.001 | 0.001 | 0.01 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | | | |
|------------------------------------|------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | 13-87 2nd Round | 13-87 3rd Round | 14-87 1st Round | 14-87 2nd Round | 14-87 3rd Round | 15-87 1st Round |
| pH | 7.99 | 8.20 | 7.92* | 7.83 | 7.93 | 8.43 |
| Conductivity (umhos) | 1010 | --- | 1710 | 1700 | --- | 840 |
| Alkalinity (as CaCO ₃) | 269 | 260 | 201 | 211 | 212 | 206 |
| Chloride | 310 | 324 | 615 | 644 | 739 | 266 |
| Fluoride | 1.8 | 1.9 | 1.2 | 1.2 | 1.4 | 1.5 |
| Ammonia (as N) | 0.32 | 0.16 | 0.41 | 0.34 | 0.36 | 0.40 |
| Nitrate (as N) | <0.1 | 0.2 | 0.4 | 0.2 | 0.1 | 0.4 |
| Sulphate | 2.0 | 4.0 | 2.5 | 3.0 | 3.0 | 10 |
| Phenols (ug·L ⁻¹) | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Calcium | 13 | 16 | 26 | 21 | 23 | 14 |
| Magnesium | 4.2 | 4.5 | 7.8 | 7.5 | 7.6 | 4.3 |
| Calculated Hardness | 49 | 58 | 98 | 84 | 89 | 52 |
| Sodium | 292 | 283 | 561 | 460 | 630 | 235 |
| Potassium | 2.4 | 2.8 | 2.9 | 2.4 | 2.6 | 2.6 |
| Iron | 0.01 | 0.09 | 0.18 | 0.01 | <0.01 | 0.12 |
| Manganese | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.01 |

+ Not reported

* Laboratory measurement

- Analysis not performed

| Parameter (mg·L ⁻¹) | Monitoring Well Sample | | | |
|------------------------------------|------------------------|--------------------|--------------------|--------------------|
| | 15-87 2nd Round | 15-87 4th Round | 15-87 4th Round | 15-87 Duplicate |
| pH | 8.08 | 8.0 | 8.0 | 8.0 |
| Conductivity (umhos) | 940 | 930 | 930 | 930 |
| Alkalinity (as CaCO ₃) | 294 | X | X | 114 |
| Chloride | 271 | X | X | 255 |
| Fluoride | 1.4 | X | X | + |
| Ammonia (as N) | 0.33 | X | X | 17.1 |
| Nitrate (as N) | <0.1 | X | X | <0.01 |
| Sulphate | 4.0 | X | X | 4.0 |
| Phenols (ug·L ⁻¹) | <1.0 | <1.0 | <1.0 | 13.5 |
| Calcium | 20 | 21 | 18 | 18 |
| Magnesium | 6.3 | 8.0 | 7.2 | 7.2 |
| Calculated Hardness | 76 | 86 | 75 | 75 |
| Sodium | 294 | 258 | 254 | 254 |
| Potassium | 2.3 | 2.4 | 2.3 | 2.3 |
| Iron | 0.01 | <0.01 | <0.01 | <0.01 |
| Manganese | 0.01 | 0.01 | 0.01 | 0.01 |

+ Not reported

* Laboratory measurement

- Analysis not performed

X Anion bottle broken in transit

MOE - SARNIA
FRESH WATER AQUIFER - QA/QC

| Parameter (mg/L) | 1st Round Pump Blank of 8-86 | 1st Round Pump Blank of 10-87 | 1st Round Pump and Filter Blank of 10-87 | 1st Round City of Sarnia Water | 1st Round Distilled Water | 1st Round Drill Rinse | 2nd Round Equipment Rinse | 3rd Round D.I. Water | 3rd Round Equipment Rinse |
|------------------------------------|------------------------------------|-------------------------------------|--|--------------------------------------|---------------------------------|-----------------------------|---------------------------------|----------------------------|---------------------------------|
| pH | 8.30* | 8.03* | 7.60* | 7.93* | - | 7.93* | 8.31* | 8.98* | 9.16* |
| Conductivity (umhos) | - | - | - | - | - | - | - | - | - |
| Alkalinity (as CaCO ₃) | 8.4 | 6.7 | 6.5 | 72 | 9.3 | 74 | 9.71 | <0.01 | 5.7 |
| Chloride | 29 | 11 | 30 | 6.8 | .5 | 17 | <0.01 | .13 | <0.01 |
| Fluoride | <0.1 | <0.1 | <0.1 | 1.1 | .1 | 1.2 | <0.10 | <0.10 | <0.10 |
| Ammonia (as N) | .44 | .02 | .01 | <0.005 | .005 | .01 | .03 | .03 | .03 |
| Nitrate (as N) | .4 | .4 | .3 | .5 | .6 | .5 | .1 | .1 | .1 |
| Sulphate | <0.5 | <0.5 | .5 | 21 | 2.5 | 24 | <0.5 | 0.5 | <0.5 |
| Phenols (ug/L) | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | - | 2.5 | <1.0 | <1.0 |
| Calcium | - | 2.9 | 2.1 | 27 | 2.76 | 33 | .5 | .5 | .7 |
| Magnesium | - | .4 | .2 | 7.3 | .2 | 7.9 | .4 | .3 | .2 |
| Calculated Hardness | - | 9 | 6 | 97 | 8 | 115 | 3 | 2.7 | 2.5 |
| Sodium | - | 18 | .1 | 3 | .4 | 70 | .4 | .4 | .4 |
| Potassium | - | 1.7 | .3 | .9 | .8 | 9.5 | .07 | .14 | .32 |
| Iron | - | .02 | .01 | .91 | .01 | .13 | <0.01 | <0.01 | <0.01 |
| Manganese | - | <0.001 | <0.001 | .01 | <0.001 | .02 | .001 | <0.001 | <0.001 |

* Laboratory measurement

- Analysis not performed

APPENDIX G2

Fresh Water Aquifer
Metals

Analyses by:

Ontario Ministry of the Environment
Rexdale, Ontario

NB: First Round Analyses Reported in mg/L
Second and Third Round Analyses Reported in ug/L

| Parameter (* analysis in mg/L) | Monitoring Well Sample | | | |
|---|---------------------------|------------------------------------|----------------------|----------------------|
| | 1-85 1st Round * | 1-85 1st Round Duplicate* | 1-85 2nd Round | 3-85 2nd Round |
| COPPER, UNF. TOTAL. CUUT ,UG/L as Cu (Copper) 00ICES | .002 | .001 | 3.30 | 4.20 |
| NICKEL, UNF. TOTAL NIUT ,UG/L as Ni (Nickel) 00ICES | <.001< | .001 | <.10<W | 13.00 |
| LEAD, UNF. TOTAL PBUT ,UG/L as Pb (Lead) 00ICES | <.003< | <.003< | .22 | .66 |
| ZINC, UNF. TOTAL ZNUZ ,UG/L as Zn (Zinc) 00ICES | .001 | .050 | 1.10 | 8.70 |
| MANGANESE, UNF. TOTAL MNUZ ,UG/L as Mn (Manganese) 00ICES | <.001< | .014 | 25.00 | .50 |
| SILVER, UNF. TOTAL AGUT ,UG/L as Ag (SILVER) 00ICES | — | — | .11<T | — |
| ARSENIC, UNF. TOTAL ASUT ,UG/L as As (Arsenic) 00ICES | <.001< | <.001< | 14.00 | 49.00 |
| BARIUM, UNF. TOTAL BAUT ,UG/L as Ba (BARIUM) 00ICES | — | — | 1900.00 | — |
| BORON, UNF. TOTAL BBUT ,UG/L as B (Boron) 00ICES | — | — | 740.00 | — |
| CADMIUM, UNF. TOTAL CDUT ,UG/L as Cd (Cadmium) 00ICES | <.0003< | <.0003< | .12<T | 5.00 |
| COBALT, UNF. TOTAL COUT ,UG/L as Co (Cobalt) 00ICES | <.001< | <.001< | .13<T | .54 |
| CHROMIUM, UNF. TOTAL CRUT ,UG/L as Cr (Chromium) 00ICES | <.001< | .002 | .62<T | 1.00 |
| MOLYBDENUM, UNF. TOTAL MOUT ,UG/L as Mo (Molybdenum) 00ICES | <.001< | <.001< | 5.30 | .71<T |
| SELENIUM, UNF. TOTAL SEUT ,UG/L as Se (Selenium) 00ICES | <.001< | <.001< | 6.80<T | 3.20<T |
| STRONTIUM, UNF. TOTAL SRUT ,UG/L as Sr (STRONTIUM) 00ICES | <.001< | .089 | 1700.00 | 1300.00 |
| VANADIUM, UNF. TOTAL VVUT ,UG/L as V (Vanadium) 00ICES | <.001< | .001 | <.01<W | 2.80 |

| Parameter (* analysis in mg/L) | Monitoring Well Sample | | | | |
|---|---------------------------|----------------------|-----------------------------------|---------------------------|----------------------|
| | 4-85 1st Round * | 4-85 2nd Round | 4-85 2nd Round Duplicate | 6-85 1st Round * | 6-85 2nd Round |
| COPPER, UNF. TOTAL. CUUT, UG/L as Cu (Copper) 001CES | <.001< | 3.60 | 3.60 | <.005< | 5.20 |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | .001 | 1.30<T | 1.20<T | .051 | 1.40 |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | <.003< | .39 | .03<T | <.015< | .19<T |
| ZINC, UNF. TOTAL ZNUZ, UG/L as Zn (Zinc) 001CES | <.001< | 3.80 | .83<T | <.010< | 1.30 |
| MANGANESE, UNF. TOTAL MNUZ, UG/L as Mn (Manganese) 001CES | .013 | 8.20 | 8.10 | .062 | 49.00 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (SILVER) 001CES | — | — | — | — | — |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 001CES | <.001< | 1.20 | 1.80 | <.001< | 7.80 |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (BARIUM) 001CES | — | — | — | — | — |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | — | — | — | — | — |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | <.0003< | .08<T | .05<T | <.0015< | .11<T |
| COBALT, UNF. TOTAL COBT, UG/L as Co (Cobalt) 001CES | .004 | .09<T | .11<T | .110 | .37<T |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | .002 | .43<T | .36<T | .052 | .16<T |
| MOLYBDENUM, UNF. TOTAL MOBT, UG/L as Mo Molybdenum 001CES | .007 | 4.70 | 4.70 | .005 | .09<T |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | <.001< | 3.70<T | 4.10<T | <.001< | 8.50<T |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (STRONTIUM) 001CES | .240 | 220.00 | 220.00 | 1.400 | 1100.00 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 001CES | <.001< | 1.50 | 1.60 | <.005< | 7.30 |

<T THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY
<U "ZERO" VALUE REPORTED IS MIN. MEASURABLE AMOUNT

— ANALYSIS NOT PERFORMED

| Parameter (* analysis in mg/L) | 6-85 | | | Monitoring Well Sample | | | 7-85 | | 7-85 2nd Round |
|---|--------------|--------------|--------------|------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | 3rd Round | 3rd Round | 3rd Round | 6-85 3rd Round | 7-85 1st Round | 7-85 1st Round | 7-85 1st Round | 7-85 1st Round | |
| | | | | Duplicate | Duplicate | Duplicate | Duplicate | Duplicate | |
| COPPER, UNF. TOTAL. CUUT, UG/L as Cu (Copper) 00ICES | 5.00 | | | 4.80 | <.001< | <.003< | | | 6.50 |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 00ICES | 2.40 | | | 3.70 | .004 | <.015< | | | 1.70 |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 00ICES | 1.10 | | | 1.20 | <.003< | <.030< | | | .12<T |
| ZINC, UNF. TOTAL ZNUT, UG/L as Zn (Zinc) 00ICES | 16.00 | | | 20.00 | <.001< | <.003< | | | 1.10 |
| MANGANESE, UNF. TOTAL MNUT, UG/L as Mn (Manganese) 00ICES | 65.00 | | | 55.00 | .023 | .054 | | | 14.00 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (SILVER) 00ICES | .16<T | | | .09<T | — | — | | | .08<T |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 00ICES | <.05<M | | | <.05<M | .001 | — | | | 3.50 |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (BARIUM) 00ICES | 600.00 | | | \$100.00 | — | — | | | 490.00 |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 00ICES | 1600.00 | | | 1200.00 | — | — | | | 940.00 |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 00ICES | <.05<M | | | .10<T | <.0003< | <.0030< | | | .16<T |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 00ICES | .04<T | | | .07<T | .008 | .008 | | | .22<T |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 00ICES | 2.00 | | | 2.60 | .006 | <.005< | | | .28<T |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 00ICES | .64 | | | <.02<M | .014 | .014 | | | 11.00 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 00ICES | 24.00 | | | 14.00 | <.001< | <.001< | | | 3.70<T |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (STRONTIUM) 00ICES | 1500.00 | | | 1300.00 | 2.400 | 1.111 | | | 1800.00 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 00ICES | <.01<M | | | <.01<M | <.001< | .001 | | | <.01<M |

<T THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY

| Parameter (* analyses in mg/L) | 7-85 | | | 7-85 | | | Monitoring Well Sample | | | 1-86 | | |
|---|---------|-------|-----------|------|-------|-----------|------------------------|-------|---------|------|---------|-------|
| | 3rd | Round | Duplicate | 3rd | Round | Duplicate | 1st | Round | Round | 2nd | 3rd | Round |
| COPPER, UNF. TOTAL. CUOT, UG/L as Cu (Copper) 00ICES | 3.20 | | 3.30 | | | | (.005) | | 1.90 | | .92 | (T) |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 00ICES | 1.50 | | 1.60 | | | | .006 | | 1.20 | (T) | .63 | (T) |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 00ICES | .26 | | .25 | | | | (.015) | | .42 | | .30 | |
| ZINC, UNF. TOTAL ZNUOT, UG/L as Zn (Zinc) 00ICES | .69 | (T) | .72 | (T) | | | (.010) | | .95 | (T) | .51 | (T) |
| MANGANESE, UNF. TOTAL MNUOT, UG/L as Mn (Manganese) 00ICES | 18.00 | | 18.00 | | | | .037 | | 32.00 | | 34.00 | |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (SILVER) 00ICES | .08 | (T) | .12 | (T) | | | — | | — | | .07 | (T) |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 00ICES | (.01) | (U) | (.01) | (U) | | | .005 | | 7.50 | | (.05) | (U) |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (BARIUM) 00ICES | 580.00 | | 590.00 | | | | — | | — | | 570.00 | |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 00ICES | 1000.00 | | 1000.00 | | | | — | | — | | 830.00 | |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 00ICES | .24 | (T) | .26 | (T) | | | (.0015) | | .28 | (T) | .37 | (T) |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 00ICES | .10 | (T) | .09 | (T) | | | .014 | | .26 | (T) | .10 | (T) |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 00ICES | 1.20 | | .66 | (T) | | | .008 | | .26 | (T) | .46 | (T) |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 00ICES | 13.00 | | 13.00 | | | | .020 | | 21.00 | | 23.00 | |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 00ICES | 8.80 | (T) | 8.20 | (T) | | | (.001) | | 3.00 | (T) | 5.90 | (T) |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (STRONTIUM) 00ICES | 2000.00 | | 2000.00 | | | | 1.400 | | 1200.00 | | 1100.00 | |
| VANADIUM, UNF. TOTAL VNUOT, UG/L as V (Vanadium) 00ICES | .14 | | (.01) | (U) | | | (.005) | | .82 | | (.01) | (U) |

(T) THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY
(U) "ZERO" VALUE REPORTED IS MIN. MEASURABLE AMOUNT

— ANALYSIS NOT PERFORMED

Monitoring Well Sample

| Parameter (* analyses in mg/L) | 3-86 1st Round * | 4-86 1st Round * | 4-86 2nd Round | 4-86 3rd Round | 5-86 1st Round |
|---|------------------------|------------------------|----------------------|----------------------|----------------------|
| COPPER, UNF. TOTAL CUUT, UG/L as Cu (Copper) 001CES | <.001< | <.005< | 2.70 | 1.50 | <.001< |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | .008 | .008 | 2.20 | .42<† | <.001< |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | <.003< | <.015< | 1.40 | .22 | <.003< |
| ZINC, UNF. TOTAL ZNUZ, UG/L as Zn (Zinc) 001CES | .019 | <.010< | 15.00 | .71<† | <.001< |
| MANGANESE, UNF. TOTAL MNUZ, UG/L as Mn (Manganese) 001CES | .010 | .020 | 17.00 | 20.00 | .010 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (SILVER) 001CES | — | — | — | .07<† | — |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 001CES | <.001< | .001 | 4.00 | <.01<† | <.001< |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (Barium) 001CES | — | — | — | 97.00 | — |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | — | — | — | 790.00 | — |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | <.0003< | <.0015< | .22<† | .20<† | <.0003< |
| COBALT, UNF. TOTAL COBT, UG/L as Co (Cobalt) 001CES | .014 | .017 | .27<† | .15<† | .002 |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | .008 | .009 | .34<† | .67<† | .001 |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | .014 | .013 | 11.00 | 11.00 | .023 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | <.001< | <.001< | 6.70<† | 10.00 | <.001< |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (Strontium) 001CES | 1.600 | 1.700 | 1600.00 | 1600.00 | .280 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 001CES | <.001< | <.005< | 1.50 | .13 | <.001< |

Monitoring Well Sample

Parameter (* analyses in mg/L)

| Parameter | Monitoring Well Sample | | | |
|---|------------------------|----------------------|----------------------|----------------------|
| | 5-86 2nd Round | 5-86 3rd Round | 6-86 1st Round | 6-86 2nd Round |
| COPPER, UNF. TOTAL CUUT, UG/L as Cu (Copper) 001CES | 2.10 | 1.20 | <.005< | 1.90 |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | <.10<u | .41<T | <.005< | 1.10<T |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | .18<T | .37 | <.015< | .89 |
| ZINC, UNF. TOTAL ZNUIT, UG/L as Zn (Zinc) 001CES | .75<T | .15<T | <.010< | 1.30 |
| MANGANESE, UNF. TOTAL MNUIT, UG/L as Mn (Manganese) 001CES | 10.00 | 8.50 | .023 | 18.00 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (Silver) 001CES | <.02<u | .07<T | — | — |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 001CES | .75<T | <.05<u | <.001< | 1.00 |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (Barium) 001CES | 86.00 | 87.00 | — | — |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | 980.00 | 960.00 | — | — |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | .17<T | .37<T | <.0015< | .93 |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 001CES | .11<T | .09<T | <.005< | .16<T |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | 1.90 | 1.10 | <.005< | .13<T |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | 21.00 | 21.00 | .019 | 15.00 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | 2.80<T | 4.40<T | <.001< | 3.20<T |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (Strontium) 001CES | 320.00 | 290.00 | .670 | 615.00 |
| VANADIUM, UNF. TOTAL VNUIT, UG/L as V (Vanadium) 001CES | <.01<u | <.01<u | <.005< | .51 |

<T THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY
<u "ZERO" VALUE REPORTED IS MIN. MEASURABLE AMOUNT

— ANALYSIS NOT PERFORMED

| Parameter (* analyses in mg/L) | Monitoring Well Sample | | | | |
|---|---------------------------|----------------------|----------------------|---------------------------|-----------------------------------|
| | 1-87 1st Round * | 1-87 2nd Round | 1-87 3rd Round | 2-87 1st Round * | 2-87 2nd Round Duplicate |
| COPPER, UNF. TOTAL CUUT, UG/L as Cu (Copper) 001CES | < .005< | 2.20 | 1.10 | < .005< | 3.80 |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | < .005< | .62<T | .85<T | .016 | 1.30<T |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | < .015< | .68 | .22 | < .015< | .47 |
| ZINC, UNF. TOTAL ZNUT, UG/L as Zn (Zinc) 001CES | .014 | 24.00 | 2.50 | < .010< | 1.30 |
| MANGANESE, UNF. TOTAL MNUT, UG/L as Mn (Manganese) 001CES | .022 | 9.30 | 12.00 | .072 | 37.00 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (SILVER) 001CES | — | — | .10<T | — | — |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 001CES | .002 | 3.40 | < .05<U | .002 | 5.10 |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (BARIUM) 001CES | — | — | 200.00 | — | — |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | — | — | 920.00 | — | — |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | < .0015< | .44<T | .57 | < .0015< | .15<T |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 001CES | < .005< | .21<T | .14<T | .035 | .47<T |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | < .005< | .46<T | 1.20 | .021 | .22<T |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | .039 | 33.00 | 32.00 | .010 | 2.90 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | < .001< | 2.50<T | 5.10<T | < .001< | 6.20<T |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (STRONTIUM) 001CES | .520 | 470.00 | 450.00 | 2.400 | 1900.00 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 001CES | < .005< | 1.20 | .18<T | < .005< | 1.70 |

<T THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY
<U "ZERO" VALUE REPORTED IS MIN. MEASURABLE AMOUNT — ANALYSIS NOT PERFORMED



| Parameter (* analyses in mg/L) | 2-87 3rd Round | | Monitoring Well Sample 3-87 1st Round | | 3-87 3rd Round | |
|--|----------------------|---------|--|---------|----------------------|--|
| | Duplicate | | * | | | |
| COPPER, UNF. TOTAL CUOT, UG/L as Cu | 1.90 | 2.20 | <.001< | 2.60 | 1.40 | |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni | .87<T | 1.10<T | .001 | .12<T | .87<T | |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb | .18<T | .18<T | <.003< | .13<T | .19<T | |
| ZINC, UNF. TOTAL ZNUOT, UG/L as Zn | .92<T | .87<T | <.001< | 23.00 | .58<T | |
| MANGANESE, UNF. TOTAL MNUOT, UG/L as Mn | 40.00 | 41.00 | .030 | 17.00 | 12.00 | |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag | .17<T | .11<T | — | .04<T | .08<T | |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As | <.01<U | <.01<U | .002 | 6.60 | <.05<U | |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba | 200.00 | 210.00 | — | 240.00 | 200.00 | |
| BORON, UNF. TOTAL BBUT, UG/L as B | 970.00 | 1000.00 | — | 1400.00 | 1300.00 | |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd | .09<T | .11<T | <.0003< | .11<T | .16<T | |
| COBALT, UNF. TOTAL COUT, UG/L as Co | .16<T | .21<T | .003 | .15<T | .25<T | |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr | 2.90 | 1.30 | .003 | .57<T | 2.50 | |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo | 3.20 | 3.40 | .006 | 11.00 | 11.00 | |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se | 13.00 | 12.00 | <.001< | 2.60<T | 4.80<T | |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr | 2000.00 | 2000.00 | .650 | 720.00 | 730.00 | |
| VANADIUM, UNF. TOTAL VNUOT, UG/L as V | .04 | .05 | <.001< | .13<T | <.01<U | |

<T THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY
<U "ZERO" VALUE REPORTED IS MIN. MEASURABLE AMOUNT

— ANALYSIS NOT PERFORMED

| Parameter (*analyses in mg/L) | Monitoring Well Sample | | | 5-87 | | |
|---|------------------------|----------------------|----------------------|------------------------|----------------------|----------------------|
| | 4-87 1st Round * | 4-87 2nd Round | 4-87 3rd Round | 5-87 1st Round * | 5-87 2nd Round | 5-87 3rd Round |
| COPPER, UNF. TOTAL, CUUT, UG/L as CU (COPPER) 001CES | .011 | 2.30 | .91<T | <.005< | 3.00 | 1.70 |
| NICKEL, UNF. TOTAL NIUT, UG/L as NI (NICKEL) 001CES | .002 | .75<T | .74<T | <.005< | .71<T | .88<T |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | <.003< | .55 | .21 | <.015< | .51 | .14<T |
| ZINC, UNF. TOTAL ZNUT, UG/L as Zn (Zinc) 001CES | .006 | 22.00 | 1.90 | <.010< | .87<T | .43<T |
| MANGANESE, UNF. TOTAL MNUT, UG/L as Mn (Manganese) 001CES | .016 | 13.00 | 12.00 | .018 | 14.00 | 14.00 |
| SILVER, UNF. TOTAL AGUT, UG/L as AG (SILVER) 001CES | — | — | .20<T | — | — | .03<T |
| ARSENIC, UNF. TOTAL ASUT, UG/L as AS (Arsenic) 001CES | <.001< | 1.80 | <.05<U | <.001< | 1.90 | <.01<U |
| BARIUM, UNF. TOTAL BAUT, UG/L as BA (BARIUM) 001CES | — | — | 120.00 | — | — | 220.00 |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | — | — | 800.00 | — | — | 1300.00 |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | <.0003< | .40<T | .47<T | <.0015< | .23<T | .16<T |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 001CES | .002 | .19<T | .12<T | <.005< | .15<T | .10<T |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | .002 | .81<T | .98<T | <.005< | .28<T | 1.60 |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | .030 | 28.00 | 28.00 | .016 | 7.70 | 7.70 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | <.001< | 2.36<T | 5.10<T | <.001< | 2.70<T | 5.40<T |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as SR (STRONTIUM) 001CES | .420 | 491.00 | 460.00 | .580 | 540.00 | 570.00 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 001CES | <.001< | .77 | <.01<U | <.005< | 1.10 | .08 |

(*) THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY

| Parameter (* analyses in mg/L) | Monitoring Well Sample | | | | |
|---|---------------------------|----------------------|-----------------------------------|---------------------------|----------------------|
| | 6-87 1st Round * | 6-87 2nd Round | 6-87 2nd Round Duplicate | 7-87 1st Round * | 7-87 2nd Round |
| COPPER, UNF. TOTAL CUUT, UG/L as Cu (Copper) 001CES | <.001< | 2.60 | 2.50 | 1.80 | 2.70 |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | .004 | <.10<u | .13<T | 1.90 | .23<T |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | <.003< | 1.10 | .83 | .43 | .27 |
| ZINC, UNF. TOTAL ZNUZ, UG/L as Zn (Zinc) 001CES | .004 | .80<T | .40<T | 2.50 | .51<T |
| MANGANESE, UNF. TOTAL MNUZ, UG/L as Mn (Manganese) 001CES | .012 | 5.60 | 5.70 | 14.00 | .50 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (SILVER) 001CES | — | — | — | .07<T | .02<T |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 001CES | <.001< | 1.20 | 1.10 | <.05<u | .89<T |
| BARIIUM, UNF. TOTAL BAUT, UG/L as Ba (BARIUM) 001CES | — | — | — | 360.00 | 66.00 |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | — | — | — | 1100.00 | 460.00 |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | <.0003< | .15<T | .11<T | .11<T | .46<T |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 001CES | .008 | .21<T | .12<T | .50<T | .31<T |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | .005 | .45<T | .70<T | 2.90 | .74<T |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | .011 | 5.20 | 5.20 | 5.00 | 67.00 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | <.001< | 1.30<T | 1.80<T | 4.30<T | 3.00<T |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (STRONTIUM) 001CES | .250 | 260.00 | 260.00 | 210.00 | 440.00 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 001CES | <.001< | .60 | .66 | 1.90 | .50 |

(T) THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY
 (U) "ZERO" VALUE REPORTED IS MIN. MEASURABLE AMOUNT

— ANALYSIS NOT PERFORMED

| Parameter | 7-87 | | 8-87 Monitoring Well Sample 8-87 | | | 9-87 | 9-87 | Duplicate* |
|---|-----------|-------------|----------------------------------|-----------|-----------|-------------|-----------|----------------------|
| | 3rd Round | 1st Round * | 1st Round | 2nd Round | 3rd Round | 1st Round * | 1st Round | |
| (* analyses in mg/L) | | | | | | | | |
| COPPER, UNF. TOTAL CUUT, UG/L as Cu (Copper) 001CES | 2.90 | .008 | 4.60 | 1.50 | .009 | <.001< | <.001< | 9-87 1st Round |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | 1.10<T | .001 | .60<T | .88<T | .036 | .003 | .003 | |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | 1.10 | <.003< | .80 | .11<T | <.003< | <.003< | <.003< | |
| ZINC, UNF. TOTAL ZNUU, UG/L as Zn (Zinc) 001CES | 23.00 | .008 | .56<T | .49<T | .005 | <.001< | <.001< | |
| MANGANESE, UNF. TOTAL MNUU, UG/L as Mn (Manganese) 001CES | .83 | .032 | 14.00 | 13.00 | .025 | .022 | .022 | |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (SILVER) 001CES | .17<T | — | — | .10<T | — | — | — | |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (ARSENIC) 001CES | <.05<M | <.001< | 1.80 | <.01<M | <.001< | <.001< | <.001< | |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (BARIUM) 001CES | 60.00 | — | — | 180.00 | — | — | — | |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | 490.00 | — | — | 1000.00 | — | — | — | |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | 1.20 | <.0003< | .49<T | .16<T | <.0003< | <.0003< | <.0003< | |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 001CES | .38<T | .003 | .19<T | .13<T | .004 | .003 | .003 | |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | 1.40 | .002 | .70<T | 1.20 | .002 | .002 | .002 | |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | 76.00 | .011 | 7.10 | 8.20 | .010 | .010 | .010 | |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | 2.40<T | <.001< | 2.90<T | 5.40<T | <.001< | <.001< | <.001< | |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (STRONTIUM) 001CES | 390.00 | .710 | 600.00 | 600.00 | .560 | .560 | .560 | |
| VANADIUM, UNF. TOTAL VUUT, UG/L as V (Vanadium) 001CES | .62 | <.001< | 1.10 | .11 | <.001< | <.001< | <.001< | |

(THIS LOW MEASUREMENT IS TENTATIVE FOR INFO ONLY)

| Parameter (* analyses in mg/L) | Monitoring Well Sample | | | | |
|---|------------------------|----------------------|------------------------|-----------------------|-------------------------|
| | 9-87 2nd Round | 9-87 3rd Round | 10-87 1st Round* | 10-87 2nd Round | 11-87 1st Round * |
| COPPER, UNF. TOTAL. CUUT, UG/L as Cu (Copper) 001CES | 2.60 | 1.00 | <.005< | 2.80 | <.005< |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | .11<T | .68<T | <.005< | .67<T | .018 |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | .68 | .27 | <.015< | 1.60 | <.015< |
| ZINC, UNF. TOTAL ZNUIT, UG/L as Zn (Zinc) 001CES | 1.50 | .80<T | <.010< | 2.00 | <.010< |
| MANGANESE, UNF. TOTAL MNUIT, UG/L as Mn (Manganese) 001CES | 12.00 | 15.00 | .023 | 14.00 | .013 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (Silver) 001CES | — | .03<T | — | — | — |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 001CES | .60<T | <.05<U | <.001< | .16<T | .001 |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (Barium) 001CES | — | 160.00 | — | — | — |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | — | 1400.00 | — | — | — |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | .05<T | .09<T | <.0015< | .24<T | <.0015< |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 001CES | .14<T | .19<T | <.005< | .16<T | .006 |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | .64<T | 1.00 | <.005< | .37<T | .031 |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | 4.50 | 5.10 | .025 | 11.00 | .034 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | 2.00<T | 4.60<T | <.001< | 2.70<T | <.001< |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (Strontium) 001CES | 600.00 | 640.00 | .520 | 500.00 | .310 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 001CES | .34<T | .39<T | <.005< | .27<T | <.005< |

<T THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY
<U "ZERO" VALUE REPORTED IS MIN. MEASURABLE AMOUNT

— ANALYSIS NOT PERFORMED

| Parameter (* analyses in mg/L) | Monitoring Well Sample | | | | |
|--|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | 11-87 2nd Round | 11-87 3rd Round | 12-87 1st Round | 12-87 2nd Round | 12-87 3rd Round |
| COPPER, UNF. TOTAL. CUOT, UG/L as Cu 001CES | 2.30 | 1.60 | — | 4.00 | 2.00 |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni 001CES | .22<T | .63<T | — | <.10<U | .57<T |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb 001CES | .15<T | .39 | — | .26 | .24 |
| ZINC, UNF. TOTAL ZNUOT, UG/L as Zn 001CES | 1.60 | .48<T | — | .95<T | 1.10 |
| MANGANESE, UNF. TOTAL MNUOT, UG/L as Mn 001CES | 3.80 | 4.00 | — | .72 | .61 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag 001CES | — | .08<T | — | .02<T | .03<T |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As 001CES | .86<T | <.05<U | — | 3.00 | <.01<U |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba 001CES | — | 290.00 | — | 340.00 | 320.00 |
| BORON, UNF. TOTAL BBUT, UG/L as B 001CES | — | 1000.00 | — | 220.00 | 220.00 |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd 001CES | .37<T | .62 | — | .27<T | .48<T |
| COBALT, UNF. TOTAL COUT, UG/L as Co 001CES | .13<T | .11<T | .008 | .68<T | .49<T |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr 001CES | .66<T | 3.00 | — | .31<T | .45<T |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo 001CES | 27.00 | 30.00 | .025 | 34.00 | 27.00 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se 001CES | 2.00<T | 4.40<T | — | 2.90<T | 5.90<T |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr 001CES | 290.00 | 310.00 | 1.111 | 2800.00 | 2300.00 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V 001CES | .59 | <.01<U | .002 | .33<T | .12 |

<T THIS LOW MEASUREMENT IS TENTATIVE FOR INFO ONLY
 "0" CALL REPORTED

Monitoring Well Sample

| Parameter (* analyses in mg/L) | 13-87 1st Round * | 13-87 2nd Round | 13-87 3rd Round | 14-87 1st Round * | 14-87 2nd Round | 14-87 3rd Round |
|---|-------------------------|-----------------------|-----------------------|-------------------------|-----------------------|-----------------------|
| COPPER, UNF. TOTAL. CUUT, UG/L as Cu (Copper) 001CES | < .005< | 2.20 | 1.40 | < .005< | 3.60 | 2.20 |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | < .005< | .74<T | .93<T | < .005< | .69<T | 1.20<T |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | < .015< | .91 | .22 | < .015< | .02<T | .21 |
| ZINC, UNF. TOTAL ZNUZ, UG/L as Zn (Zinc) 001CES | .014 | 6.10 | .52<T | < .010< | .16<T | .46<T |
| MANGANESE, UNF. TOTAL MNUZ, UG/L as Mn (Manganese) 001CES | .011 | 7.60 | 8.20 | .015 | 8.20 | 12.00 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (Silver) 001CES | — | — | .10<T | — | — | .14<T |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 001CES | .001 | 1.20 | < .05<M | .001 | 2.60 | < .05<M |
| BARIIUM, UNF. TOTAL BAUT, UG/L as Ba (Barium) 001CES | — | — | 360.00 | — | — | 330.00 |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | — | — | 910.00 | — | — | 950.00 |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | < .0015< | .34<T | .41<T | < .0015< | .18<T | .24<T |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 001CES | .007 | .10<T | .14<T | .007 | .11<T | .12<T |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | .006 | .16<T | 1.40 | < .005< | 1.70 | 1.40 |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | .035 | 27.00 | 29.00 | .016 | 12.00 | 13.00 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | < .001< | 3.10<T | 4.00<T | < .001< | 2.90<T | 5.80<T |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (Strontium) 001CES | .280 | 310.00 | 320.00 | .550 | 500.00 | 510.00 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 001CES | < .005< | .79 | < .01<M | < .005< | 1.30 | < .01<M |

<T THIS LOW MEASUREMENT IS TENTATIVE. FOR INFO ONLY
<U "ZERO" VALUE REPORTED IS MIN. MEASURABLE AMOUNT

— ANALYSIS NOT PERFORMED

| Parameter (* analyses in mg/L) | Monitoring Well Sample | | | |
|---|----------------------------|-----------------------|-----------------------|------------------------------------|
| | 15-87 1st Round * | 15-87 2nd Round | 15-87 4th Round | 15-87 4th Round Duplicate |
| COPPER, UNF. TOTAL CUUT, UG/L as Cu (Copper) 001CES | (.005< | 2.30 | 4.70 | 5.10 |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | (.005< | .48< | 1.50< | 1.60< |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | (.015< | .26 | .39 | .28 |
| ZINC, UNF. TOTAL ZNUZ, UG/L as Zn (Zinc) 001CES | (.010< | 1.30 | 1.80 | 1.70 |
| MANGANESE, UNF. TOTAL MNUZ, UG/L as Mn (Manganese) 001CES | (.005< | 8.50 | 9.80 | 10.00 |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (SILVER) 001CES | — | .09< | .09< | .11< |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 001CES | .005 | 1.20 | .98< | .95< |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (Barium) 001CES | — | 430.00 | 480.00 | 510.00 |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | — | 1000.00 | 1000.00 | 1200.00 |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | (.0015< | .17< | .11< | .18< |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 001CES | .007 | .09< | .10< | .11< |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | (.005< | .60< | 1.20 | 8.10 |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | .022 | 12.00 | 12.00 | 13.00 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | (.001< | 2.40< | 3.20< | 3.50< |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (Strontium) 001CES | .290 | 410.00 | 450.00 | 490.00 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 001CES | (.005< | (.01< | (.01< | (.01< |

| Parameter (mg/L-1) | 1st Round Pump Blank of 8-86 | 1st Round Pump Blank of 10-87 | 1st Round Pump and Filter Blank of 10-87 | 1st Round City of Sarnia Water | 1st Round Distilled Water | 1st Round Drill Rinse |
|--|------------------------------------|-------------------------------------|--|--------------------------------------|---------------------------------|-----------------------------|
| COPPER, UNF. TOTAL. CUUT, MG/L as Cu 522AE2 | .005 | <.005< | <.005< | .001 | — | <.005< |
| NICKEL, UNF. TOTAL NIUT, MG/L as Ni 522AE2 | .009 | <.005< | <.005< | .011 | — | <.005< |
| LEAD, UNF. TOTAL PBUT, MG/L as Pb 522AE2 | <.003< | <.015< | <.015< | <.003< | — | <.015< |
| ZINC, UNF. TOTAL ZNUZ, MG/L as Zn 522AE2 | .005 | <.010< | <.010< | <.001< | — | <.010< |
| MANGANESE, UNF. TOTAL MNUZ, MG/L as Mn 522AE2 | .001 | <.005< | <.005< | .031 | — | .028 |
| ARSENIC, UNF. TOTAL ASUT, MG/L as As 540AF3 | <.001< | <.001< | <.001< | .014 | — | <.001< |
| CADMIUM, UNF. TOTAL CDUT, MG/L as Cd 522AE2 | <.0003< | <.0015< | <.0015< | <.0003< | — | <.0015< |
| COBALT, UNF. TOTAL COUT, MG/L as Co 522AE2 | <.001< | <.005< | <.005< | .025 | <.001< | <.005< |
| CHROMIUM, UNF. TOTAL CRUT, MG/L as Cr 522AE2 | .002 | <.005< | <.005< | .013 | — | <.005< |
| MOLYBDENUM, UNF. TOTAL MOUT, MG/L as Mo 522AE2 | <.001< | <.005< | <.005< | .007 | <.001< | .006 |
| SELENIUM, UNF. TOTAL SEUT, MG/L as Se 540AF3 | <.001< | <.001< | <.001< | <.001< | — | <.001< |
| STRONTIUM, UNF. TOTAL SRUT, MG/L as Sr 522AE2 | .005 | <.005< | <.005< | 1.900 | <.001< | .250 |
| VANADIUM, UNF. TOTAL VVUT, MG/L as V 522AE2 | <.001< | <.005< | <.005< | <.001< | <.001< | <.005< |

— Analysis not performed

| Parameter | 2nd Round Equipment Rinse | 3rd Round D.I. Water | 3rd Round Equipment Rinse |
|---|---------------------------------|----------------------------|---------------------------------|
| COPPER, UNF. TOTAL, CUUT, UG/L as Cu (Copper) 001CES | .88<T | 3.30 | — |
| NICKEL, UNF. TOTAL NIUT, UG/L as Ni (Nickel) 001CES | .20<T | .08<T | — |
| LEAD, UNF. TOTAL PBUT, UG/L as Pb (Lead) 001CES | 3.80 | 4.10 | — |
| ZINC, UNF. TOTAL ZNUZ, UG/L as Zn (Zinc) 001CES | 14.00 | 29.00 | — |
| MANGANESE, UNF. TOTAL MNUZ, UG/L as Mn (Manganese) 001CES | .40<T | .68 | — |
| SILVER, UNF. TOTAL AGUT, UG/L as Ag (Silver) 001CES | — | .24<T | — |
| ARSENIC, UNF. TOTAL ASUT, UG/L as As (Arsenic) 001CES | <.05<W | .65<T | — |
| BARIUM, UNF. TOTAL BAUT, UG/L as Ba (Barium) 001CES | — | 3.40 | — |
| BORON, UNF. TOTAL BBUT, UG/L as B (Boron) 001CES | — | 34.00 | — |
| CADMIUM, UNF. TOTAL CDUT, UG/L as Cd (Cadmium) 001CES | .06<T | .12<T | — |
| COBALT, UNF. TOTAL COUT, UG/L as Co (Cobalt) 001CES | .11<T | .18<T | <.02<W |
| CHROMIUM, UNF. TOTAL CRUT, UG/L as Cr (Chromium) 001CES | .46<T | .51<T | — |
| MOLYBDENUM, UNF. TOTAL MOUT, UG/L as Mo (Molybdenum) 001CES | .03<T | .15<T | 55.00 |
| SELENIUM, UNF. TOTAL SEUT, UG/L as Se (Selenium) 001CES | .31<T | 3.70<T | — |
| STRONTIUM, UNF. TOTAL SRUT, UG/L as Sr (Strontium) 001CES | 1.10 | 5.00 | 1300.00 |
| VANADIUM, UNF. TOTAL VVUT, UG/L as V (Vanadium) 001CES | .05<T | .12<T | 3.00 |

APPENDIX G3

Fresh Water Aquifer
Volatile Organics

Analyses by:

Barringer-Magenta Ltd.,
Rexdale, Ontario

CLIENT: INTERA TECHNOLOGIES LTD.
W.O. #

DATE:

PAGE XX/XX

VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-1-85 1ST QTR | MSMW-1-85 1ST QTR DUPLICATE | MSMW-1-85 2ND QTR | MSMW-1-85 3RD QTR | MSMW-3-85 2ND QTR | MSMW-3-85 3RD QTR | MSMW-4-85 1ST QTR |
|----------------------------------|----------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | \$1.8 |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | \$2.9 |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | \$1.7 | 9.1 | 10.7 | \$1.6 | \$1.4 | \$1.1 | ND |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACRYLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | ND | \$1.2 | 4.3 | 4.4 | \$1.3 | 1.0 | ND |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | \$1.1 | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | \$1.2 | ND | \$1.3 | \$1.2 | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | ND | \$1.3 | ND | 11.4 | 11.3 | 2.2 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | \$1.8 | \$1.4 | \$1.4 | \$1.2 | 10.9 | 10.2 | 1.9 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | \$1.1 | ND | ND | \$1.2 | \$1.2 | \$1.1 |
| 34 M-XYLENE & P-XYLENE | .5 | \$1.1 | \$1.3 | \$1.1 | ND | 0.5 | \$1.4 | \$1.2 |
| 35 O-XYLENE | .5 | ND | \$1.2 | ND | ND | \$1.4 | \$1.3 | \$1.1 |
| 36 STYRENE | .5 | ND | \$1.3 | \$1.1 | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-1-85 1ST QTR | MSMW-1-85 1ST QTR DUPLICATE | MSMW-1-85 2ND QTR | MSMW-1-85 3RD QTR | MSMW-3-85 2ND QTR | MSMW-3-85 3RD QTR | MSMW-4-85 1ST QTR |
|--------------------------------|----------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | *.1 | ND | ND | ND | ND | *.1 |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | *.1 | ND | ND | *.2 | *.1 | *.1 |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | *.1 | *.1 | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 92% | 101% | 97% | 89% | 94% | 97% | 98% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 92% | 104% | 84% | 91% | 99% | 111% | 93% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 88% | 101% | 93% | 93% | 102% | 86% | 87% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-4-85 2ND QTR | MSMW-4-85 2ND QTR DUPLICATE | MSMW-4-85 2ND QTR DUPL(RPT) | MSMW-4-85 3RD QTR | MSMW-6-85 1ST QTR | MSMW-6-85 1ST QTR QC-REPEAT | MSMW-6-85 2ND QTR |
|----------------------------------|----------------|----------------------|-----------------------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | ND | 1.6 | 1.5 | 1.1 | ND | ND | 1.9 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | 1.3 | 1.2 | 1.6 | 1.4 | 1.5 | 1.5 | 1.3 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | 3.0 | 3.1 | 2.2 | 1.2 | ND | ND | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | 1.1 | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | 1.7 | 1.7 | 1.3 | ND | 1.1 | ND | 1.1 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | 1.2 | 1.2 | 1.2 | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | 1.4 | 1.4 | 1.4 | ND | ND | ND | 1.1 |
| 35 O-XYLENE | .5 | 1.3 | 1.3 | 1.2 | ND | ND | ND | 1.1 |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-4-85 | MSMW-4-85 | MSMW-4-85 | MSMW-4-85 | MSMW-6-85 | MSMW-6-85 | MSMW-6-85 |
|------------------------------|----------------|-----------|----------------------|----------------------|-----------|-----------|----------------------|-----------|
| | | 2ND QTR | 2ND QTR DUPLICATE | 2ND QTR DUPL(RPT) | 3RD QTR | 1ST QTR | 1ST QTR QC-REPEAT | 2ND QTR |
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | 1.1 | 1.1 | 1.1 | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | 1.1 | 1.1 | 1.1 | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|----------------------------|---------|-----|-----|-----|------|------|------|-----|
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 99% | 93% | 95% | 114% | 109% | 108% | 92% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 90% | 88% | 92% | 121% | 107% | 109% | 94% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 95% | 93% | 96% | 97% | 107% | 109% | 97% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-85 3RD QTR | MSMW-6-85 3RD QTR DUPLICATE | MSMW-6-85 3RD QTR DUPL(RPT) | MSMW-7-85 1ST QTR | MSMW-7-85 1ST QTR DUPLICATE | MSMW-7-85 2ND QTR | MSMW-7-85 2ND QTR QC-REPEAT |
|----------------------------------|----------------|----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|-----------------------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | \$1.1 | \$1.1 | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | \$1.5 | \$1.3 | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | ND | \$1.2 | \$1.1 | ND | ND | \$1.5 | \$1.5 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACRYLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | \$1.5 | \$1.4 | \$1.5 | \$1.6 | \$1.1 | \$1.4 | 1.0 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | ND | ND | \$1.1 | ND | ND | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | \$1.1 | ND | ND | \$1.4 | \$1.4 | \$1.4 | \$1.4 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | ND | ND | ND | ND | ND | \$1.1 |
| 35 O-XYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-85 3RD QTR | MSMW-6-85 3RD QTR DUPLICATE | MSMW-6-85 3RD QTR DUPL(RPT) | MSMW-7-85 1ST QTR | MSMW-7-85 1ST QTR DUPLICATE | MSMW-7-85 2ND QTR | MSMW-7-85 2ND QTR QC-REPEAT |
|--------------------------------|----------------|----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|-----------------------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 94% | 94% | 88% | 90% | 95% | 97% | 95% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 117% | 83% | 103% | 89% | 90% | 99% | 98% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 86% | 74% | 86% | 83% | 91% | 92% | 95% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-7-85 3RD QTR | MSMW-7-85 3RD QTR DUPLICATE | MSMW-1-86 1ST QTR | MSMW-1-86 2ND QTR | MSMW-1-86 2ND QTR QC-REPEAT | MSMW-1-86 3RD QTR | MSMW-3-86 1ST QTR |
|----------------------------------|----------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | \$1.3 | \$1.8 | ND | \$1.0 | \$1.1 | \$1.9 | ND |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | \$1.2 | 1.0 | \$1.6 | \$1.4 | \$1.3 | \$1.5 | ND |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | \$1.3 | \$1.3 | ND | \$1.1 | ND | \$1.1 | \$1.2 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | ND | ND | \$1.2 | \$1.2 | ND | \$1.2 |
| 35 O-XYLENE | .5 | ND | ND | ND | \$1.1 | \$1.1 | ND | ND |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-7-85 3RD QTR | MSMW-7-85 3RD QTR DUPLICATE | MSMW-1-86 1ST QTR | MSMW-1-86 2ND QTR | MSMW-1-86 2ND QTR QC-REPEAT | MSMW-1-86 3RD QTR | MSMW-3-86 1ST QTR |
|--------------------------------|----------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | *.1 |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | *.1 |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 93% | 97% | 106% | 99% | 89% | 116% | 93% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 90% | 97% | 107% | 90% | 94% | 97% | 89% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 91% | 93% | 107% | 93% | 94% | 92% | 92% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. US/L | MSMW-4-86 1ST QTR | MSMW-4-86 2ND QTR | MSMW-4-86 3RD QTR | MSMW-5-86 1ST QTR | MSMW-5-86 2ND QTR | MSMW-5-86 3RD QTR | MSMW-6-86 1ST QTR |
|----------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | \$.7 | \$.5 | \$.5 | \$.4 | \$.8 | \$1.2 | ND |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACRYLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | \$.9 | \$.3 | 1.6 | \$.1 | \$.6 | 6.1 | \$.2 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | \$.2 | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | ND | ND | ND | ND | \$.1 | \$.2 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | \$.1 | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | ND | \$.1 | \$.1 | ND | ND | \$.3 | \$.1 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | \$.2 | ND | \$.1 | \$.1 | \$.2 | ND |
| 35 O-XYLENE | .5 | ND | \$.1 | ND | ND | ND | \$.1 | ND |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | \$.1 | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-4-86 1ST QTR | MSMW-4-86 2ND QTR | MSMW-4-86 3RD QTR | MSMW-5-86 1ST QTR | MSMW-5-86 2ND QTR | MSMW-5-86 3RD QTR | MSMW-6-86 1ST QTR |
|--------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 119% | 93% | 100% | 99% | 97% | 73% | 114% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 127% | 95% | 93% | 92% | 95% | 82% | 122% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 125% | 95% | 88% | 91% | 93% | 55% | 123% |

VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-86 2ND QTR | MSMW-6-86 3RD QTR | MSMW-7-86 1ST QTR | MSMW-7-86 2ND QTR | MSMW-7-86 3RD QTR | MSMW-8-86 1ST QTR | MSMW-8-86 2ND QTR |
|----------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | 2.0 | \$1.4 | ND | \$1.4 | ND | 3.7 | \$1.6 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | \$1.4 | \$1.7 | \$1.2 | \$1.3 | ND | ND | \$1.4 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | \$1.1 | ND | ND | ND | \$1.1 | \$1.1 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | ND | \$1.1 | ND | ND | ND | \$1.1 | ND |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | \$1.1 | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | \$1.2 | ND | ND | ND | ND | ND | \$1.1 |
| 35 O-XYLENE | .5 | \$1.1 | ND | ND | \$1.1 | ND | ND | ND |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | \$1.1 | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-86 2ND QTR | MSMW-6-86 3RD QTR | MSMW-7-86 1ST QTR | MSMW-7-86 2ND QTR | MSMW-7-86 3RD QTR | MSMW-8-86 1ST QTR | MSMW-8-86 2ND QTR |
|--------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 77% | 89% | 109% | 94% | 85% | 95% | 97% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 98% | 78% | 120% | 102% | 83% | 88% | 97% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 98% | 87% | 121% | 97% | 88% | 90% | 102% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-8-86 3RD QTR | MSMW-1-87 1ST QTR | MSMW-1-87 2ND QTR | MSMW-1-87 3RD QTR | MSMW-2-87 1ST QTR | MSMW-2-87 2ND QTR | MSMW-2-87 3RD QTR |
|----------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | ND | \$ 2 | \$ 7 | \$ 6 | ND | \$ 5 | \$ 7 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACRYLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | \$ 7 | \$ 6 | \$ 8 | \$ 3 | \$ 6 | \$ 4 | \$ 9 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | \$ 2 | \$ 2 | \$ 3 | \$ 3 | \$ 2 | ND | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | \$ 1 | ND | \$ 1 | \$ 1 | ND | \$ 1 | ND |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | ND | \$ 2 | ND | ND | \$ 2 | ND |
| 35 O-XYLENE | .5 | ND | ND | \$ 1 | ND | ND | \$ 1 | ND |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

S = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-8-86 3RD QTR | MSMW-1-87 1ST QTR | MSMW-1-87 2ND QTR | MSMW-1-87 3RD QTR | MSMW-2-87 1ST QTR | MSMW-2-87 2ND QTR | MSMW-2-87 3RD QTR |
|------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|----------------------------|---------|------|-----|------|-----|------|-----|-----|
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 87% | 99% | 102% | 82% | 101% | 92% | 96% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 118% | 96% | 95% | 94% | 104% | 91% | 96% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 82% | 89% | 96% | 95% | 99% | 97% | 93% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-2-87 3RD QTR DUPLICATE | MSMW-3-87 1ST QTR | MSMW-3-87 2ND QTR | MSMW-3-87 3RD QTR | MSMW-4-87 1ST QTR | MSMW-4-87 1ST QTR QC-REPEAT | MSMW-4-87 2ND QTR |
|----------------------------------|----------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | \$1.3 | \$1.9 | \$1.5 | ND | 47.6 | 56.6 | \$1.1 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACRYLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | 1.2 | 1.4 | 1.1 | \$1.5 | 91.6 | 91.9 | \$1.3 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | 79.8 | 89.7 | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | \$1.2 | \$1.2 | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | \$1.2 | \$1.3 | ND | \$1.2 | \$1.2 | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | \$1.1 | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | ND | \$1.1 | \$1.1 | ND | \$1.5 | \$1.5 | \$1.1 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | \$1.3 | \$1.3 | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | ND | \$1.1 | ND | \$1.2 | \$1.2 | \$1.2 |
| 35 O-XYLENE | .5 | ND | ND | ND | ND | \$1.1 | \$1.1 | \$1.1 |
| 36 STYRENE | .5 | ND | ND | ND | ND | 0.9 | 1.0 | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,1,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-2-87 3RD QTR DUPLICATE | MSMW-3-87 1ST QTR | MSMW-3-87 2ND QTR | MSMW-3-87 3RD QTR | MSMW-4-87 1ST QTR | MSMW-4-87 1ST QTR QC-REPEAT | MSMW-4-87 2ND QTR |
|--------------------------------|----------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------|----------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3,4-METHYLBENZENE | .2 | ND | ND | ND | ND | 2.1 | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 86% | 93% | 103% | 102% | 104% | 110% | 91% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 96% | 90% | 98% | 119% | 100% | 109% | 92% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 91% | 88% | 93% | 95% | 99% | 107% | 92% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-4-87 3RD QTR | MSMW-5-87 1ST QTR | MSMW-5-87 1ST QTR QC-REPEAT | MSMW-5-87 2ND QTR | MSMW-5-87 3RD QTR | MSMW-6-87 1ST QTR | MSMW-6-87 2ND QTR |
|----------------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | *.1 | *.5 | *.7 | 3.0 | *.2 | *.5 | 2.1 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | *.1 | *.2 | *.2 | *.5 | *.9 | 6.2 | *.5 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | 1.0 | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | 0.5 |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | ND | ND | ND | ND | *.2 | *.1 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | *.1 | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | *.1 | *.1 | *.1 | ND | ND | *.1 | *.1 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | ND | ND | *.2 | ND | ND | *.2 |
| 35 O-XYLENE | .5 | ND | ND | ND | *.1 | ND | ND | *.1 |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

= COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-4-87 3RD QTR | MSMW-5-87 1ST QTR | MSMW-5-87 1ST QTR QC-REPEAT | MSMW-5-87 2ND QTR | MSMW-5-87 3RD QTR | MSMW-6-87 1ST QTR | MSMW-6-87 2ND QTR |
|--------------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3,4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 81% | 98% | 104% | 82% | 102% | 99% | 78% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 88% | 107% | 110% | 97% | 91% | 96% | 98% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 89% | 95% | 109% | 98% | 90% | 90% | 96% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-87 2ND QTR DUPLICATE | MSMW-6-87 3RD QTR | MSMW-7-87 1ST QTR | MSMW-7-87 1ST QTR QC -REPEAT | MSMW-7-87 2ND QTR | MSMW-7-87 3RD QTR | MSMW-8-87 1ST QTR |
|----------------------------------|----------------|-----------------------------------|----------------------|----------------------|------------------------------------|----------------------|----------------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | \$1.3 | \$1.1 | 4.5 | 5.3 | \$1.2 | \$1.2 | \$1.4 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | \$1.2 | \$1.6 | \$1.9 | 1.8 | \$1.5 | 1.8 | 4.5 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | \$1.2 | ND | 4.1 |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | \$1.1 | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | \$1.1 | \$1.1 | 0.6 | 0.6 | ND | 0.5 | \$1.2 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | ND | \$1.1 | 1.0 | 1.0 | ND | 0.8 | \$1.5 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | \$1.2 | \$1.2 | ND | \$1.1 | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | \$1.1 | ND | ND | \$1.1 |
| 34 M-XYLENE & P-XYLENE | .5 | \$1.1 | ND | \$1.3 | \$1.3 | \$1.3 | \$1.2 | \$1.2 |
| 35 O-XYLENE | .5 | \$1.1 | ND | \$1.2 | \$1.2 | \$1.2 | \$1.1 | ND |
| 36 STYRENE | .5 | ND | ND | \$1.1 | \$1.1 | ND | ND | \$1.4 |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,1,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

% = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-87 2ND QTR DUPLICATE | MSMW-6-87 3RD QTR | MSMW-7-87 1ST QTR | MSMW-7-87 1ST QTR GC-REPEAT | MSMW-7-87 2ND QTR | MSMW-7-87 3RD QTR | MSMW-8-87 1ST QTR |
|--------------------------------|----------------|-----------------------------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | %.1 | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 93% | 99% | 101% | 99% | 99% | 98% | 102% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 102% | 94% | 93% | 94% | 99% | 115% | 107% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 102% | 90% | 94% | 96% | 94% | 86% | 99% |

M.O. #

VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-8-87 2ND QTR | MSMW-8-87 3RD QTR | MSMW-8-87 3RD QTR QC-REPEAT | MSMW-9-97 1ST QTR | MSMW-9-97 2ND QTR | MSMW-9-97 3RD QTR | MSMW-10-97 1ST QTR |
|----------------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|-----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | \$1.3 | \$1.1 | \$1.1 | \$1.5 | \$1.0 | \$1.6 | ND |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | \$1.3 | \$1.2 | \$1.2 | \$1.2 | \$1.3 | 2.3 | \$1.2 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | \$1.1 | ND | \$1.3 | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | \$1.1 | \$1.1 | \$1.1 | ND | ND | \$1.1 | 0.6 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | \$1.1 |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | \$1.2 | \$1.1 | ND | ND | ND | \$1.2 | \$1.1 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | \$1.2 | ND | ND | ND | \$1.2 | ND | ND |
| 35 O-XYLENE | .5 | \$1.1 | ND | ND | ND | \$1.1 | ND | \$1.2 |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

& = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-8-87 | MSMW-8-87 | MSMW-8-87 | MSMW-9-87 | MSMW-9-87 | MSMW-9-87 | MSMW-10-87 |
|--------------------------------|---------|-----------|-----------|----------------------|-----------|-----------|-----------|------------|
| | UG/L | 2ND QTR | 3RD QTR | 3RD QTR GC-REPEAT | 1ST QTR | 2ND QTR | 3RD QTR | 1ST QTR |
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 84% | 81% | 105% | 94% | 96% | 102% | 117% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 102% | 97% | 103% | 93% | 94% | 90% | 124% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 100% | 92% | 88% | 89% | 101% | 91% | 123% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. US/L | MSMW-10-87 2ND QTR | MSMW-10-87 3RD QTR | MSMW-10-87 3RD QTR QC-REPEAT | MSMW-11-87 1ST QTR | MSMW-11-87 2ND QTR | MSMW-11-87 3RD QTR | MSMW-11-87 3RD QTR QC-REPEAT |
|----------------------------------|----------------|-----------------------|-----------------------|------------------------------------|-----------------------|-----------------------|-----------------------|------------------------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | 3.3 | *.2 | *.1 | *.6 | *.1 | *.3 | *.1 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | 1.4 | *.2 | *.2 | *.1 | *.3 | 1.9 | 1.3 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | *.1 | *.1 | *.1 | ND | ND | ND | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | *.1 | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | *.1 | *.1 | *.1 | ND | ND | ND | ND |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | *.2 | ND | ND | ND | *.2 | ND | ND |
| 35 O-XYLENE | .5 | *.1 | ND | ND | ND | *.1 | ND | ND |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

= COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-10-87 | MSMW-10-87 | MSMW-10-87 | MSMW-11-87 | MSMW-11-87 | MSMW-11-87 | MSMW-11-87 |
|--------------------------------|---------|------------|------------|------------|------------|------------|------------|------------|
| | UG/L | 2ND QTR | 3RD QTR | 3RD QTR | 1ST QTR | 2ND QTR | 3RD QTR | 3RD QTR |
| | | | | QC-REPEAT | | | | QC-REPEAT |
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 84% | 74% | 125% | 101% | 79% | 86% | 105% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 102% | 97% | 126% | 104% | 98% | 115% | 117% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 94% | 93% | 81% | 90% | 97% | 76% | 94% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. US/L | MSMW-12-87 1ST QTR | MSMW-12-87 2ND QTR | MSMW-12-87 3RD QTR | MSMW-13-87 1ST QTR | MSMW-13-87 2ND QTR | MSMW-13-87 3RD QTR | MSMW-14-87 1ST QTR |
|----------------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | 6.7 | 7.5 | 3.9 | 8.2 | 8.4 | 8.1 | 8.5 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | 70.0 | 1.3 | 6.2 | 1.8 | 8.2 | 6.4 | ND |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | 0.8 | ND | 8.2 | 0.6 | ND | 8.3 | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | 8.1 | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | 8.3 | ND | 8.1 | 8.1 | ND | 8.1 | 8.2 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | 8.1 | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | 1.0 | ND | 1.1 | ND | ND | 8.1 | 8.1 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | 8.2 | ND | 8.1 | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | 8.1 | ND | 8.1 | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | 8.4 | 8.4 | 8.3 | ND | 8.2 | ND | ND |
| 35 O-XYLENE | .5 | 8.2 | 8.2 | 8.1 | ND | 8.1 | ND | ND |
| 36 STYRENE | .5 | 8.1 | ND | 8.1 | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-12-87 1ST QTR | MSMW-12-87 2ND QTR | MSMW-12-87 3RD QTR | MSMW-13-87 1ST QTR | MSMW-13-87 2ND QTR | MSMW-13-87 3RD QTR | MSMW-14-87 1ST QTR |
|--------------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | *.1 | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | *.1 | ND | *.1 | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 79% | 106% | 102% | 102% | 95% | 89% | 99% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 74% | 102% | 89% | 107% | 93% | 83% | 104% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 66% | 100% | 91% | 94% | 100% | 79% | 102% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-14-87 2ND QTR | MSMW-14-87 3RD QTR | MSMW-15-87 1ST QTR | MSMW-15-87 2ND QTR | MSMW-15-87 4TH QTR | MSMW-15-87 4TH QTR QC-REPEAT | MSMW-15-87 4TH QTR DUPLICATE |
|------------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------------|------------------------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | \$1.7 | \$1.6 | \$1.7 | \$1.9 | \$1.3 | \$1.3 | 2.9 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACRYLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | \$1.5 | 1.5 | 3.2 | \$1.4 | 1.5 | 1.7 | 21.5 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | \$1.1 | \$1.3 | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | ND | \$1.2 | ND | ND | ND | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | \$1.1 | ND | \$1.3 | \$1.1 | ND | ND | \$1.1 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | \$1.2 | ND | \$1.1 | \$1.1 | ND | ND | ND |
| 35 O-XYLENE | .5 | \$1.1 | ND | ND | ND | ND | ND | ND |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

COMPOUND

M.D.L.
UG/LMSMW-14-87
2ND QTRMSMW-14-87
3RD QTRMSMW-15-87
1ST QTRMSMW-15-87
2ND QTRMSMW-15-87
4TH QTRMSMW-15-87
4TH QTRMSMW-15-87
4TH QTR

QC-REPEAT

DUPLICATE

| | | | | | | | | |
|----|---------------------------|-----|----|----|----|----|----|----|
| 41 | BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 42 | 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 43 | 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 44 | 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 45 | 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 46 | PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND |
| 47 | 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 48 | 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 49 | 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 50 | 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 51 | 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 52 | 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 53 | 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 54 | HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND |
| 55 | 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 56 | HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | | |
|----|-------------------------|---------|-----|-----|------|-----|------|------|------|
| 57 | 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 78% | 81% | 102% | 95% | 131% | 137% | 129% |
| 58 | 1,4-DICHLOROBUTANE | 10 UG/L | 94% | 89% | 108% | 95% | 128% | 133% | 139% |
| 59 | 4-BROMOFLUOROBENZENE | 2 UG/L | 95% | 83% | 100% | 91% | 124% | 119% | 112% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

= COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 87-39-01 | 87-39-01 | P8-86 | P10-87-BLF | CITYW | CITYW | DIW |
|----------------------------------|----------------|------------------|----------------------|------------------|------------------|------------------|----------------------|------------------|
| | | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC |
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | ND | ND | \$1.5 | \$1.8 | \$1.8 | \$1.4 | \$1.7 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | ND | \$1.1 | \$2.5 | \$1.2 | \$1.1 | \$1.2 | \$2.2 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | 8.8 | 9.5 | 7.1 | \$1.1 | 11.6 | 11.1 | \$1.2 |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | \$1.3 | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | 5.7 | 5.8 | \$1.3 | ND | 7.7 | 6.9 | \$1.1 |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | \$1.2 | \$1.2 | 1.9 | \$1.2 | ND | ND | 0.6 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | \$1.2 |
| 30 DIBROMOCHLOROMETHANE | 2.0 | 3.9 | 3.9 | ND | ND | 3.9 | 4.1 | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | ND | \$1.2 | \$1.1 | \$1.1 | \$1.1 | \$1.1 |
| 35 O-XYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 STYRENE | .5 | ND | ND | \$1.2 | \$1.1 | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

= COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 97-39-01 | 87-39-01 | P8-86 | P10-87-BLF | CITYW | CITYW | DIW |
|--------------------------------|----------------|------------------|----------------------|------------------|------------------|------------------|----------------------|------------------|
| | | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC |
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | 1.1 | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | 1.1 | ND | 1.1 | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 91% | 93% | 90% | 105% | 96% | 93% | 102% |
| 58 1,4-DICHLOROBUTANE | 10 US/L | 90% | 91% | 104% | 105% | 96% | 93% | 93% |
| 59 4-BROMOFLUOROBENZENE | 2 US/L | 86% | 91% | 106% | 106% | 98% | 100% | 90% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-16-87 3RD QTR QA/QC |
|----------------------------------|----------------|--------------------------------|
| 1 CHLOROMETHANE | 5.0 | ND |
| 2 VINYL CHLORIDE | 5.0 | ND |
| 3 CHLOROETHANE | 5.0 | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | 1.2 |
| 5 BROMOMETHANE | 2.0 | ND |
| 6 ACROLEIN | 25.0 | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND |
| 9 DICHLOROMETHANE | 1.0 | 1.7 |
| 10 ACRYLONITRILE | 10.0 | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND |
| 14 CHLOROFORM | .5 | 4.6 |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND |
| 17 BENZENE | .5 | 1.2 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND |
| 19 TRICHLOROETHENE | .5 | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | 2.9 |
| 22 DIBROMOMETHANE | 2.0 | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND |
| 26 TOLUENE | .5 | 1.2 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND |
| 29 TETRACHLOROETHENE | .5 | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | 11.6 |
| 31 1,2-DIBROMOETHANE | 2.0 | ND |
| 32 CHLOROBENZENE | .5 | ND |
| 33 ETHYLBENZENE | .5 | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND |
| 35 O-XYLENE | .5 | ND |
| 36 STYRENE | .5 | ND |
| 37 ISOPROPYLBENZENE | .2 | ND |
| 38 BROMOFORM | 2.0 | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND |
| 40 PROPYLBENZENE | .2 | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

COMPOUND

M.D.L. MSMW-16-87
UG/L 3RD QTR
QA/QC

| | | | |
|----|---------------------------|-----|-----|
| 41 | BROMOBENZENE | 1.0 | ND |
| 42 | 1-ETHYL-3,4-METHYLBENZENE | .2 | ND |
| 43 | 1,3,5-TRIMETHYLBENZENE | .2 | ND |
| 44 | 1-ETHYL-2-METHYLBENZENE | .2 | ND |
| 45 | 1,2,4-TRIMETHYLBENZENE | .2 | *.1 |
| 46 | PENTACHLOROETHANE | 1.0 | ND |
| 47 | 1,3-DICHLOROBENZENE | .5 | ND |
| 48 | 1,2,3-TRIMETHYLBENZENE | .2 | ND |
| 49 | 1,4-DICHLOROBENZENE | .5 | ND |
| 50 | 1,3-DIETHYLBENZENE | .2 | ND |
| 51 | 1,4-DIETHYLBENZENE | .2 | ND |
| 52 | 1,2-DIETHYLBENZENE | .2 | ND |
| 53 | 1,2-DICHLOROBENZENE | .5 | ND |
| 54 | HEXACHLOROETHANE | 1.0 | ND |
| 55 | 1,2,4-TRICHLOROBENZENE | 1.0 | ND |
| 56 | HEXACHLORO-1,3-BUTADIENE | .5 | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | |
|----|-------------------------|---------|-----|
| 57 | 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 91% |
| 58 | 1,4-DICHLOROBUTANE | 10 UG/L | 94% |
| 59 | 4-BROMOFLUOROBENZENE | 2 UG/L | 92% |

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SPIKED VOLATILE SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#1 2ND QTR | REAGENT BLANK#1 3RD QTR | REAGENT BLANK#2 3RD QTR | REAGENT BLANK#1 4TH QTR |
|----------------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 CHLOROMETHANE | 20.0 | 85 | 112 | 83 | 88 | 58 |
| 2 VINYL CHLORIDE | 20.0 | 83 | 87 | 87 | 96 | 104 |
| 3 CHLOROETHANE | 20.0 | 86 | 88 | 72 | 91 | 92 |
| 4 TRICHLOROFLUOROMETHANE | 5.0 | 128 | 62 | 63 | 92 | 39 |
| 5 BROMOMETHANE | 20.0 | 101 | 103 | 70 | 94 | 71 |
| 6 ACROLEIN | 21.0 | 94 | 79 | 44 | 97 | |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 5.0 | 115 | 117 | 75 | 95 | 89 |
| 8 1,1-DICHLOROETHENE | 5.0 | 87 | 81 | 71 | 99 | 69 |
| 9 DICHLOROMETHANE | 5.0 | 88 | | 65 | 93 | |
| 10 ACRYLONITRILE | 30.2 | 92 | 113 | 73 | 99 | |
| 11 TRANS-1,2-DICHLOROETHENE | 5.0 | 79 | 51 | 75 | 96 | 109 |
| 12 1,1-DICHLOROETHANE | 5.0 | 92 | 78 | 71 | 99 | 123 |
| 13 CIS-1,2-DICHLOROETHENE | 5.0 | 77 | 60 | 81 | 96 | 130 |
| 14 CHLOROFORM | 5.0 | 107 | 95 | 69 | 97 | 122 |
| 15 1,1,1-TRICHLOROETHANE | 5.0 | 110 | 79 | 67 | 98 | 133 |
| 16 CARBON TETRACHLORIDE | 5.0 | 106 | 67 | 64 | 98 | 135 |
| 17 BENZENE | 5.0 | 107 | | 78 | 102 | 122 |
| 18 1,2-DICHLOROETHANE | 5.0 | 104 | 110 | 88 | 104 | 142 |
| 19 TRICHLOROETHENE | 5.0 | 101 | 69 | 73 | 106 | 142 |
| 20 1,2-DICHLOROPROPANE | 5.0 | 110 | 82 | 84 | 110 | 148 |
| 21 BROMODICHLOROMETHANE | 5.0 | 105 | 68 | 68 | 108 | 146 |
| 22 DIBROMOMETHANE | 6.1 | 101 | 79 | 88 | 106 | 160 |
| 23 DICHLOROACETONITRILE | 27.4 | 127 | 103 | 66 | 113 | |
| 24 1-BROMO-2-CHLOROETHANE | 5.9 | 108 | 96 | 83 | 103 | 165 |
| 25 CIS-1,3-DICHLOROPROPENE | 6.2 | 106 | 116 | 66 | 98 | 272 |
| 26 TOLUENE | 5.0 | 110 | 124 | 63 | 97 | 250 |
| 27 TRANS-1,3-DICHLOROPROPENE | 3.8 | 112 | 101 | 71 | 88 | 100 |
| 28 1,1,2-TRICHLOROETHANE | 5.0 | 111 | 98 | 97 | 135 | 160 |
| 29 TETRACHLOROETHENE | 5.0 | 112 | 75 | 86 | 99 | 147 |
| 30 DIBROMOCHLOROMETHANE | 5.0 | 111 | 97 | 82 | 101 | 107 |
| 31 1,2-DIBROMOETHANE | 6.0 | 104 | 110 | 97 | 103 | 102 |
| 32 CHLOROBENZENE | 5.0 | 109 | 85 | 85 | 98 | 105 |
| 33 ETHYLBENZENE | 5.0 | 103 | 82 | 78 | 102 | 100 |
| 34 M-XYLENE & P-XYLENE | 1.5 | 114 | 91 | 77 | 98 | 94 |
| 35 O-XYLENE | 2.0 | 106 | 88 | 79 | 98 | 136 |
| 36 STYRENE | 2.0 | 106 | 91 | 82 | 103 | 134 |
| 37 ISOPROPYLBENZENE | 2.0 | 106 | 89 | 67 | 102 | 89 |
| 38 BROMOFORM | 5.0 | 100 | 103 | 73 | 106 | 112 |
| 39 1,1,2,2-TETRACHLOROETHANE | 5.0 | 101 | 98 | 93 | 102 | 123 |
| 40 PROPYLBENZENE | 1.9 | 106 | 87 | 63 | 99 | 65 |

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SPIKED VOLATILE SAMPLES - PERCENT RECOVERIES (CONTINUED)

| COMPOUND | AMOUNT US/L | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#1 2ND QTR | REAGENT BLANK#1 3RD QTR | REAGENT BLANK#2 3RD QTR | REAGENT BLANK#1 4TH QTR |
|------------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 41 BROMOBENZENE | 3.4 | 105 | 94 | 74 | 102 | 86 |
| 42 1-ETHYL-3&4-METHYLBENZENE | 1.9 | 121 | 93 | 64 | 98 | 95 |
| 43 1,3,5-TRIMETHYLBENZENE | 2.0 | 103 | 86 | 64 | 102 | 90 |
| 44 1-ETHYL-2-METHYLBENZENE | 2.0 | 106 | 91 | 68 | 99 | 95 |
| 45 1,2,4-TRIMETHYLBENZENE | 1.9 | 108 | 92 | 67 | 103 | 94 |
| 46 PENTACHLOROETHANE | 2.9 | 111 | 99 | 70 | 108 | 85 |
| 47 1,3-DICHLOROBENZENE | 2.5 | 110 | 100 | 65 | 105 | 83 |
| 48 1,2,3-TRIMETHYLBENZENE | 2.0 | 105 | 96 | 68 | 107 | 95 |
| 49 1,4-DICHLOROBENZENE | 2.9 | 109 | 99 | 68 | 106 | 118 |
| 50 1,3-DIETHYLBENZENE | 2.0 | 111 | 94 | 61 | 106 | 95 |
| 51 1,4-DIETHYLBENZENE | 1.9 | 111 | 96 | 61 | 105 | 94 |
| 52 1,2-DIETHYLBENZENE | 1.9 | 110 | 96 | 60 | 105 | 93 |
| 53 1,2-DICHLOROBENZENE | 3.0 | 108 | 97 | 70 | 109 | 95 |
| 54 HEXACHLOROETHANE | 2.5 | 109 | 95 | 53 | 105 | 75 |
| 55 1,2,4-TRICHLOROBENZENE | 3.0 | 120 | 102 | 54 | 110 | 100 |
| 56 HEXACHLORO-1,3-BUTADIENE | 2.0 | 113 | 95 | 33 | 106 | 89 |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | |
|----------------------------|---------|-----|-----|-----|-----|-----|
| 57 1-CHLORO-2-BROMOPROPANE | 10 US/L | 108 | 101 | 103 | 94 | 143 |
| 58 1,4-DICHLOROBUTANE | 10 US/L | 107 | 106 | 113 | 102 | 138 |
| 59 4-BROMOFLUOROBENZENE | 2 US/L | 101 | 104 | 88 | 114 | 153 |

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SPIKED VOLATILE SAMPLES - PERCENT RECOVERIES

| COMPOUND | MSMW-6-85 2ND QTR | MSMW-3-86 1ST QTR | MSMW-5-86 1ST QTR | MSMW-5-86 2ND QTR | MSMW-2-87 1ST QTR | MSMW-2-87 3RD QTR | MSMW-7-87 3RD QTR | MSMW-11-87 1ST QTR |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|
| 1 CHLOROMETHANE | 110 | 89 | 109 | 104 | 134 | 77 | 61 | 117 |
| 2 VINYL CHLORIDE | 122 | 77 | 184 | 91 | 151 | 82 | 65 | 162 |
| 3 CHLOROETHANE | 90 | 75 | 140 | 67 | 162 | 81 | 52 | 123 |
| 4 TRICHLOROFLUOROMETHANE | 197 | 62 | 111 | 106 | 135 | 99 | 73 | 160 |
| 5 BROMOMETHANE | 104 | 85 | 153 | 81 | 133 | 82 | 75 | 144 |
| 6 ACROLEIN | 88 | 71 | 57 | 106 | 27 | 111 | | 60 |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 148 | 104 | 135 | 86 | 158 | 100 | 73 | 152 |
| 8 1,1-DICHLOROETHENE | 155 | 81 | 106 | 86 | 136 | 101 | 89 | 114 |
| 9 DICHLOROMETHANE | 100 | 54 | 70 | 100 | 106 | 96 | 62 | 111 |
| 10 ACRYLONITRILE | 103 | 68 | 62 | 110 | 48 | 113 | | 142 |
| 11 TRANS-1,2-DICHLOROETHENE | 111 | 82 | 89 | 130 | 120 | 103 | 90 | 120 |
| 12 1,1-DICHLOROETHANE | 121 | 86 | 94 | 115 | 103 | 110 | 98 | 111 |
| 13 CIS-1,2-DICHLOROETHENE | 85 | 69 | 85 | 107 | 79 | 106 | 104 | 87 |
| 14 CHLOROFORM | 105 | 88 | 105 | 107 | 110 | 111 | 105 | 116 |
| 15 1,1,1-TRICHLOROETHANE | 110 | 83 | 106 | 106 | 119 | 108 | 95 | 122 |
| 16 CARBON TETRACHLORIDE | 117 | 84 | 105 | 105 | 118 | 105 | 92 | 117 |
| 17 BENZENE | 104 | 68 | 101 | 106 | 113 | 105 | 102 | 122 |
| 18 1,2-DICHLOROETHANE | 98 | 83 | 103 | 107 | 93 | 120 | 124 | 124 |
| 19 TRICHLOROETHENE | 113 | 88 | 104 | 99 | 112 | 110 | | 122 |
| 20 1,2-DICHLOROPROPANE | 105 | 84 | 98 | 108 | 112 | 111 | 115 | 122 |
| 21 BROMODICHLOROMETHANE | 100 | 83 | 100 | 106 | 115 | 116 | 123 | 123 |
| 22 DIBROMOMETHANE | 96 | 81 | 93 | 105 | 103 | 112 | 121 | 115 |
| 23 DICHLOROACETONITRILE | 73 | 76 | 63 | 137 | 48 | 140 | | 193 |
| 24 1-BROMO-2-CHLOROETHANE | 99 | 86 | 93 | 110 | 114 | 113 | 119 | 124 |
| 25 CIS-1,3-DICHLOROPROPENE | 101 | 88 | 99 | 115 | 136 | 106 | 113 | 152 |
| 26 TOLUENE | 104 | 93 | 109 | 137 | 126 | 123 | 97 | 130 |
| 27 TRANS-1,3-DICHLOROPROPENE | 95 | 87 | 95 | 117 | 78 | 131 | 108 | 83 |
| 28 1,1,2-TRICHLOROETHANE | 93 | 94 | 111 | 111 | 116 | 132 | 123 | 126 |
| 29 TETRACHLOROETHENE | 100 | 88 | 100 | 105 | 118 | 75 | 88 | 128 |
| 30 DIBROMOCHLOROMETHANE | 144 | 89 | 104 | 104 | 113 | 100 | 101 | 130 |
| 31 1,2-DIBROMOETHANE | 147 | 86 | 104 | 127 | 123 | 104 | 102 | 121 |
| 32 CHLOROBENZENE | 107 | 91 | 112 | 102 | 99 | 101 | 99 | 113 |
| 33 ETHYLBENZENE | 111 | 94 | 106 | 102 | 103 | 100 | 94 | 116 |
| 34 M-XYLENE & P-XYLENE | 102 | 81 | 130 | 95 | 116 | 96 | 87 | 124 |
| 35 O-XYLENE | 106 | 94 | 109 | 104 | 107 | 95 | 93 | 118 |
| 36 STYRENE | 105 | 91 | 108 | 102 | 103 | 124 | 106 | 118 |
| 37 ISOPROPYLBENZENE | 111 | 84 | 104 | 100 | 99 | 99 | 87 | 113 |
| 38 BROMOFORM | 106 | 87 | 103 | 106 | 100 | 106 | 112 | 119 |
| 39 1,1,1,2-TETRACHLOROETHANE | 104 | 91 | 106 | 112 | 104 | 111 | | 116 |
| 40 PROPYLBENZENE | 108 | 86 | 107 | 99 | 100 | 100 | 93 | 113 |

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SPIKED VOLATILE SAMPLES - PERCENT RECOVERIES (CONTINUED)

| COMPOUND | MSMW-6-85 2ND QTR | MSMW-3-86 1ST QTR | MSMW-5-86 1ST QTR | MSMW-5-86 2ND QTR | MSMW-2-87 1ST QTR | MSMW-2-87 3RD QTR | MSMW-7-87 3RD QTR | MSMW-11-87 1ST QTR |
|--------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|
| 41 BROMOBENZENE | 107 | 89 | 104 | 102 | 101 | 102 | 102 | 115 |
| 42 1-ETHYL-3,4-METHYLBENZENE | 112 | 74 | 108 | 100 | 115 | 103 | 94 | 100 |
| 43 1,3,5-TRIMETHYLBENZENE | 106 | 98 | 101 | 100 | 92 | 104 | 95 | 119 |
| 44 1-ETHYL-2-METHYLBENZENE | 108 | 95 | 105 | 102 | 103 | 98 | 96 | 113 |
| 45 1,2,4-TRIMETHYLBENZENE | 104 | 89 | 108 | 106 | 102 | 101 | 99 | 116 |
| 46 PENTACHLOROETHANE | 109 | 89 | 105 | 122 | 105 | 107 | | 115 |
| 47 1,3-DICHLOROBENZENE | 107 | 98 | 106 | 103 | 99 | 104 | 101 | 119 |
| 48 1,2,3-TRIMETHYLBENZENE | 108 | 86 | 107 | 104 | 102 | 107 | 106 | 115 |
| 49 1,4-DICHLOROBENZENE | 110 | 85 | 104 | 101 | 95 | 110 | 108 | 117 |
| 50 1,3-DIETHYLBENZENE | 111 | 83 | 102 | 100 | 101 | 101 | 93 | 115 |
| 51 1,4-DIETHYLBENZENE | 109 | 81 | 110 | 103 | 91 | 99 | 89 | 108 |
| 52 1,2-DIETHYLBENZENE | 113 | 84 | 107 | 102 | 104 | 102 | 97 | 115 |
| 53 1,2-DICHLOROBENZENE | 104 | 84 | 105 | 104 | 100 | 106 | 110 | 116 |
| 54 HEXACHLOROETHANE | 108 | 91 | 101 | 103 | 101 | 99 | 92 | 119 |
| 55 1,2,4-TRICHLOROBENZENE | 109 | 82 | 104 | 103 | 95 | 113 | 114 | 112 |
| 56 HEXACHLORO-1,3-BUTADIENE | 110 | 85 | 107 | 94 | 106 | 108 | 94 | 116 |
| SURROGATE STANDARD RECOVERIES: | | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 98 | 102 | 97 | 101 | 115 | 120 | 102 | 109 |
| 58 1,4-DICHLOROBUTANE | 97 | 97 | 96 | 106 | 116 | 111 | 118 | 112 |
| 59 4-BROMOFLUOROBENZENE | 98 | 100 | 101 | 102 | 113 | 115 | 123 | 112 |

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SPIKED VOLATILE SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | 87-39-01 1ST QTR |
|----------------------------------|----------------|---------------------|
| 1 CHLOROMETHANE | 20.0 | 81 |
| 2 VINYL CHLORIDE | 20.0 | 96 |
| 3 CHLOROETHANE | 20.0 | 124 |
| 4 TRICHLOROFLUOROMETHANE | 5.0 | 165 |
| 5 BROMOMETHANE | 20.0 | 119 |
| 6 ACROLEIN | 21.0 | 98 |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 5.0 | 161 |
| 8 1,1-DICHLOROETHENE | 5.0 | 122 |
| 9 DICHLOROMETHANE | 5.0 | 93 |
| 10 ACRYLONITRILE | 30.2 | 87 |
| 11 TRANS-1,2-DICHLOROETHENE | 5.0 | 91 |
| 12 1,1-DICHLOROETHANE | 5.0 | 92 |
| 13 CIS-1,2-DICHLOROETHENE | 5.0 | 70 |
| 14 CHLOROFORM | 5.0 | 100 |
| 15 1,1,1-TRICHLOROETHANE | 5.0 | 106 |
| 16 CARBON TETRACHLORIDE | 5.0 | 106 |
| 17 BENZENE | 5.0 | 117 |
| 18 1,2-DICHLOROETHANE | 5.0 | 108 |
| 19 TRICHLOROETHENE | 5.0 | 111 |
| 20 1,2-DICHLOROPROPANE | 5.0 | 111 |
| 21 BROMODICHLOROMETHANE | 5.0 | 104 |
| 22 DIBROMOMETHANE | 6.1 | 108 |
| 23 DICHLOROACETONITRILE | 27.4 | 116 |
| 24 1-BROMO-2-CHLOROETHANE | 5.9 | 115 |
| 25 CIS-1,3-DICHLOROPROPENE | 6.2 | 108 |
| 26 TOLUENE | 5.0 | 118 |
| 27 TRANS-1,3-DICHLOROPROPENE | 3.8 | 110 |
| 28 1,1,2-TRICHLOROETHANE | 5.0 | 118 |
| 29 TETRACHLOROETHENE | 5.0 | 120 |
| 30 DIBROMOCHLOROMETHANE | 5.0 | 100 |
| 31 1,2-DIBROMOETHANE | 6.0 | 103 |
| 32 CHLOROBENZENE | 5.0 | 103 |
| 33 ETHYLBENZENE | 5.0 | 101 |
| 34 M-XYLENE & P-XYLENE | 1.5 | 114 |
| 35 O-XYLENE | 2.0 | 108 |
| 36 STYRENE | 2.0 | 105 |
| 37 ISOPROPYLBENZENE | 2.0 | 105 |
| 39 BROMOFORM | 5.0 | 105 |
| 39 1,1,1,2-TETRACHLOROETHANE | 5.0 | 101 |
| 40 PROPYLBENZENE | 1.9 | 105 |

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SPIKED VOLATILE SAMPLES - PERCENT RECOVERIES (CONTINUED)

| COMPOUND | AMOUNT UG/L | 87-89-01 1ST QTR |
|--------------------------------|----------------|---------------------|
| 41 BROMOBENZENE | 3.4 | 102 |
| 42 1-ETHYL-3,4-METHYLBENZENE | 1.9 | 117 |
| 43 1,3,5-TRIMETHYLBENZENE | 2.0 | 106 |
| 44 1-ETHYL-2-METHYLBENZENE | 2.0 | 101 |
| 45 1,2,4-TRIMETHYLBENZENE | 1.9 | 107 |
| 46 PENTACHLOROETHANE | 2.9 | 104 |
| 47 1,3-DICHLOROBENZENE | 2.5 | 105 |
| 48 1,2,3-TRIMETHYLBENZENE | 2.0 | 103 |
| 49 1,4-DICHLOROBENZENE | 2.9 | 104 |
| 50 1,3-DIETHYLBENZENE | 2.0 | 108 |
| 51 1,4-DIETHYLBENZENE | 1.9 | 110 |
| 52 1,2-DIETHYLBENZENE | 1.9 | 110 |
| 53 1,2-DICHLOROBENZENE | 3.0 | 105 |
| 54 HEXACHLOROETHANE | 2.5 | 108 |
| 55 1,2,4-TRICHLOROBENZENE | 3.0 | 121 |
| 56 HEXACHLORO-1,3-BUTADIENE | 2.0 | 110 |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 113 |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 114 |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 116 |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | FIELD BLANK#1 1ST QTR | FIELD BLANK#2 1ST QTR | FIELD BLANK#3 1ST QTR | FIELD BLANK#4 1ST QTR | FIELD BLANK#5 1ST QTR | FIELD BLANK#1 2ND QTR | FIELD BLANK#2 2ND QTR |
|----------------------------------|----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | 37.6 | 14.9 | 27.3 | 26.6 | ND | 8.6 | 9.2 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | 167.0 | 1.4 | 1.7 | 1.5 | 1.8 | 1.7 | 1.4 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | 24.4 | ND | 1.2 | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | 1.1 | ND | ND | ND | ND | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | 1.1 | 1.1 | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | ND | 1.1 | 1.1 | ND | ND | ND | ND |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | 1.1 | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | ND | ND | ND | ND | 1.2 | 1.1 |
| 35 O-XYLENE | .5 | ND | ND | ND | ND | ND | 1.1 | ND |
| 36 STYRENE | .5 | ND | 1.1 | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,1,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

S = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | FIELD BLANK#1 1ST QTR | FIELD BLANK#2 1ST QTR | FIELD BLANK#3 1ST QTR | FIELD BLANK#4 1ST QTR | FIELD BLANK#5 1ST QTR | FIELD BLANK#1 2ND QTR | FIELD BLANK#2 2ND QTR |
|------------------------------|----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|----------------------------|---------|-----|------|------|-----|-----|------|-----|
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 95% | 102% | 104% | 98% | 93% | 92% | 95% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 91% | 102% | 105% | 89% | 84% | 100% | 94% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 85% | 101% | 105% | 93% | 83% | 99% | 96% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | FIELD BLANK#1 3RD QTR | FIELD BLANK#2 3RD QTR | FIELD BLANK#1 4TH QTR |
|----------------------------------|----------------|-----------------------------|-----------------------------|-----------------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | 8.0 | 4.5 | 9.2 |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | 11.7 | 6.2 | 4.3 |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND |
| 17 BENZENE | .5 | ND | ND | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND |
| 26 TOLUENE | .5 | ND | ND | 8.2 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | ND | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | ND | ND |
| 35 O-XYLENE | .5 | ND | ND | ND |
| 36 STYRENE | .5 | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

S = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| | COMPOUND | M.D.L. UG/L | FIELD | FIELD | FIELD |
|--------------------------------|---------------------------|----------------|--------------------|--------------------|--------------------|
| | | | BLANK#1 3RD QTR | BLANK#2 3RD QTR | BLANK#1 4TH QTR |
| 41 | BROMOBENZENE | 1.0 | ND | ND | ND |
| 42 | 1-ETHYL-3&4-METHYLBENZENE | .2 | ND | ND | ND |
| 43 | 1,3,5-TRIMETHYLBENZENE | .2 | ND | ND | ND |
| 44 | 1-ETHYL-2-METHYLBENZENE | .2 | ND | ND | ND |
| 45 | 1,2,4-TRIMETHYLBENZENE | .2 | ND | ND | ND |
| 46 | PENTACHLOROETHANE | 1.0 | ND | ND | ND |
| 47 | 1,3-DICHLOROBENZENE | .5 | ND | ND | ND |
| 48 | 1,2,3-TRIMETHYLBENZENE | .2 | ND | ND | ND |
| 49 | 1,4-DICHLOROBENZENE | .5 | ND | ND | ND |
| 50 | 1,3-DIETHYLBENZENE | .2 | ND | ND | ND |
| 51 | 1,4-DIETHYLBENZENE | .2 | ND | ND | ND |
| 52 | 1,2-DIETHYLBENZENE | .2 | ND | ND | ND |
| 53 | 1,2-DICHLOROBENZENE | .5 | ND | ND | ND |
| 54 | HEXACHLOROETHANE | 1.0 | ND | ND | ND |
| 55 | 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND |
| 56 | HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | | AMOUNT | | | |
| 57 | 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 98% | 90% | 128% |
| 58 | 1,4-DICHLOROBUTANE | 10 UG/L | 84% | 90% | 143% |
| 59 | 4-BROMOFLUOROBENZENE | 2 UG/L | 83% | 82% | 111% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | HOUSE BLK 1ST QTR |
|----------------------------------|----------------|----------------------|
| 1 CHLOROMETHANE | 5.0 | ND |
| 2 VINYL CHLORIDE | 5.0 | ND |
| 3 CHLOROETHANE | 5.0 | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | ND |
| 5 BROMOMETHANE | 2.0 | ND |
| 6 ACROLEIN | 25.0 | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND |
| 9 DICHLOROMETHANE | 1.0 | *.7 |
| 10 ACRYLONITRILE | 10.0 | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND |
| 14 CHLOROFORM | .5 | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND |
| 17 BENZENE | .5 | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND |
| 19 TRICHLOROETHENE | .5 | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND |
| 22 DIBROMOMETHANE | 2.0 | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND |
| 26 TOLUENE | .5 | ND |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND |
| 29 TETRACHLOROETHENE | .5 | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND |
| 32 CHLOROBENZENE | .5 | ND |
| 33 ETHYLBENZENE | .5 | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND |
| 35 O-XYLENE | .5 | ND |
| 36 STYRENE | .5 | ND |
| 37 ISOPROPYLBENZENE | .2 | ND |
| 38 BROMOFORM | 2.0 | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND |
| 40 PROPYLBENZENE | .2 | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | HOUSE BLK 1ST QTR |
|------------------------------|----------------|----------------------|
| 41 BROMOBENZENE | 1.0 | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | |
|----------------------------|---------|-----|
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 94% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 89% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 89% |

APPENDIX G4

Fresh Water Aquifer
Base Neutral Extractables

Analyses by:

Barringer-Magenta Ltd.
Rexdale, Ontario

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-1-85 1ST QTR | MSMW-1-85 1ST QTR DUPLICATE | MSMW-1-85 2ND QTR | MSMW-1-85 2ND QTR QC REPEAT | MSMW-1-85 3RD QTR | MSMW-3-85 2ND QTR | MSMW-3-85 2ND QTR QC REPEAT |
|--------------------------------|----------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | 1.3 | 1.4 | ND | ND | 0.3 |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 15.4 | 25.0 | ND | ND | ND | 1.2 | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | 2.3 | 1.1 | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | ND | ND | 1.7 | ND | ND | ND | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-1-85 1ST QTR | MSMW-1-85 1ST QTR DUPLICATE | MSMW-1-85 2ND QTR | MSMW-1-85 2ND QTR QC REPEAT | MSMW-1-85 3RD QTR | MSMW-3-85 2ND QTR | MSMW-3-85 2ND QTR QC REPEAT |
|--------------------------------|----------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ‡.9 |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 76% | 78% | 54% | 51% | 59% | 70% | 105% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 78% | 82% | 60% | 55% | 124% | 56% | 97% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 127% | 131% | 124% | 113% | 89% | 53% | 90% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-3-85 3RD QTR | MSMW-4-85 1ST QTR | MSMW-4-85 2ND QTR | MSMW-4-85 2ND QTR DUPLICATE | MSMW-4-85 3RD QTR | MSMW-4-85 3RD QTR QC-REPEAT | MSMW-6-85 1ST QTR |
|--------------------------------|----------------|----------------------|----------------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | 0.8 | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | 26.7 | ND | ND | ND | ND | 2.6 |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 1.1 | ND | 11.0 | ND | ND | ND | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-3-85 | MSMW-4-85 | MSMW-4-85 | MSMW-4-85 | MSMW-4-85 | MSMW-4-85 | MSMW-4-85 | MSMW-6-85 |
|--------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | UG/L | 3RD QTR | 1ST QTR | 2ND QTR | 2ND QTR | 3RD QTR | 3RD QTR | 1ST QTR | 1ST QTR |
| | | | | | DUPLICATE | | QC-REPEAT | | |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | | |
| 48 NITROBENZENE-D5 | 25 UG/L | 25% | 66% | 102% | 86% | 43% | 22% | 64% | |
| 49 2-FLUOROBIPHENYL | 25 UG/L | 46% | 75% | 99% | 80% | 43% | 33% | 64% | |
| 50 4-TERPHENYL-D14 | 25 UG/L | 43% | 109% | 101% | 76% | 120% | 107% | 90% | |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. US/L | MSMW-6-85 2ND QTR | MSMW-6-85 3RD QTR | MSMW-6-85 3RD QTR DUPLICATE | MSMW-7-85 1ST QTR | MSMW-7-85 1ST QTR DUPLICATE | MSMW-7-85 2ND QTR | MSMW-7-85 3RD QTR |
|--------------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | ND | ND | 20.5 | 22.9 | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 1.6 | 52.3 | ND | 1.4 | ND | ND | 1.9 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-85 2ND QTR | MSMW-6-85 3RD QTR | MSMW-6-85 3RD QTR DUPLICATE | MSMW-7-85 1ST QTR | MSMW-7-85 1ST QTR DUPLICATE | MSMW-7-85 2ND QTR | MSMW-7-85 3RD QTR |
|---------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|-----|------|-----|------|------|-----|-----|
| 48 NITROBENZENE-D5 | 50 UG/L | 80% | 69% | 42% | 55% | 55% | 61% | 81% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 78% | 232% | 52% | 68% | 64% | 63% | 73% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 72% | 114% | 56% | 109% | 122% | 99% | 32% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| | COMPOUND | M.D.L. UG/L | MSMW-7-85 | MSMW-1-86 | MSMW-1-86 | MSMW-1-86 | MSMW-3-86 | MSMW-4-86 | MSM1-4-86 |
|----|-----------------------------|----------------|----------------------|-----------|-----------|-----------|-----------|-----------|----------------------|
| | | | 3RD QTR DUPLICATE | 1ST QTR | 2ND QTR | 3RD QTR | 1ST QTR | 1ST QTR | 1ST QTR QC-REPEAT |
| 1 | BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 | 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 | 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 | 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 | BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 | HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 | N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 | NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 | ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 | BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 | 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 | NAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 | HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 | 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 | 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 | HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 | 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 | ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 | DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 | 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 | ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 | 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 | FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 | 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 | DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 | N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | 1.0 | ND | ND |
| 27 | AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 | 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 | HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 | PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 | ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 | DI-N-BUTYL PHTHALATE | .5 | 0.7 | 6.1 | 1.9 | 1.7 | 22.2 | 3.7 | 6.1 |
| 33 | FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 | BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 | PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 | BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | 11.4 | ND | ND |
| 37 | BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 | CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 | 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 | BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 6.1 | 1.6 | 8.5 | 62.4 | 1.2 | 8.6 | 8.5 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-7-85 3RD QTR DUPLICATE | MSMW-1-86 1ST QTR | MSMW-1-86 2ND QTR | MSMW-1-86 3RD QTR | MSMW-3-86 1ST QTR | MSMW-4-86 1ST QTR | MSMW-4-86 1ST QTR QC-REPEAT |
|--------------------------------|----------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | 1.8 | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 34% | 56% | 81% | 42% | 53% | 75% | 64% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 29% | 71% | 80% | 39% | 58% | 78% | 62% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 34% | 145% | 129% | 42% | 212% | 148% | 193% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-4-86 2ND QTR | MSMW-4-86 3RD QTR | MSMW-5-86 1ST QTR | MSMW-5-86 1ST QTR QC-REPEAT | MSMW-5-86 2ND QTR | MSMW-5-86 3RD QTR | MSMW-5-86 3RD QTR QC-REPEAT |
|--------------------------------|----------------|----------------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | 1.4 | ND | ND | ND | 0.5 | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 1.8 | ND | 14.4 | 36.5 | ND | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 1.2 | ND | 2.6 | 8.5 | 8.9 | 8.7 | 1.8 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-4-86 | MSMW-4-86 | MSMW-5-86 | MSMW-5-86 | MSMW-5-86 | MSMW-5-86 | MSMW-5-86 | MSMW-5-86 |
|--------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | UG/L | 2ND QTR | 3RD QTR | 1ST QTR | 1ST QTR | 2ND QTR | 3RD QTR | 3RD QTR | 3RD QTR |
| | | | | | QC-REPEAT | | | | QC-REPEAT |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | *.8 | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 66% | 74% | 76% | 59% | 81% | 79% | 79% | 110% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 74% | 52% | 79% | 71% | 77% | 79% | 79% | 79% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 103% | 62% | 113% | 126% | 74% | 77% | 77% | 77% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-86 1ST QTR | MSMW-6-86 2ND QTR | MSMW-6-86 3RD QTR | MSMW-7-86 1ST QTR | MSMW-7-86 2ND QTR | MSMW-7-86 3RD QTR | MSMW-8-86 1ST QTR |
|--------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 3.0 | ND | ND | 3.7 | ND | ND | 41.1 |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | 6.1 |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 1.4 | 3.2 | 1.9 | 1.1 | ND | ND | 1.6 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-86 1ST QTR | MSMW-6-86 2ND QTR | MSMW-6-86 3RD QTR | MSMW-7-86 1ST QTR | MSMW-7-86 2ND QTR | MSMW-7-86 3RD QTR | MSMW-8-86 1ST QTR |
|--------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 50% | 34% | 68% | 72% | 115% | 90% | 56% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 54% | 35% | 61% | 75% | 94% | 81% | 68% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 172% | 96% | 39% | 195% | 129% | 108% | 187% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-8-86 | MSMW-8-86 | MSMW-1-87 | MSMW-1-87 | MSMW-1-87 | MSMW-1-87 | MSMW-2-87 |
|--------------------------------|----------------|-----------|-----------|-----------|-----------|----------------------|-----------|-----------|
| | | 2ND QTR | 3RD QTR | 1ST QTR | 2ND QTR | 2ND QTR QC-REPEAT | 3RD QTR | 1ST QTR |
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | 0.7 | ND | ND | 0.6 | 1.3 | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | 0.5 | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | ND | 38.5 | 1.6 | 1.9 | 0.7 | 2.7 |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | ND | ND | 1.4 | 1.6 | 1.8 | 359.0 | 1.7 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-8-86 | MSMW-8-86 | MSMW-1-87 | MSMW-1-87 | MSMW-1-87 | MSMW-1-87 | MSMW-2-87 |
|---------------------------|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | UG/L | 2ND QTR | 3RD QTR | 1ST QTR | 2ND QTR | 2ND QTR | 3RD QTR | 1ST QTR |
| | | | | | | QC-REPEAT | | |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | 8.4 | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|-----|-----|-----|-----|-----|-----|------|
| 48 NITROBENZENE-D5 | 50 UG/L | 72% | 54% | 57% | 46% | 32% | 64% | 83% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 70% | 54% | 68% | 66% | 47% | 55% | 85% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 90% | 73% | 95% | 77% | 87% | 50% | 147% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-2-87 2ND QTR | MSMW-2-87 2ND QTR DUPLICATE | MSMW-2-87 3RD QTR | MSMW-2-87 3RD QTR DUPLICATE | MSMW-3-87 1ST QTR | MSMW-3-87 2ND QTR | MSMW-3-87 3RD QTR |
|--------------------------------|----------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBEZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBEZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBEZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBEZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | ND | 0.5 | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBEZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 2.6 | ND | ND | ND | 20.6 | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 9.7 | 2.7 | 1.8 | 1.5 | 1.3 | ND | 1.7 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-2-87 2ND QTR | MSMW-2-87 2ND QTR DUPLICATE | MSMW-2-87 3RD QTR | MSMW-2-87 3RD QTR DUPLICATE | MSMW-3-87 1ST QTR | MSMW-3-87 2ND QTR | MSMW-3-87 3RD QTR |
|--------------------------------|----------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 63% | 72% | 96% | 110% | 76% | 77% | 60% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 67% | 70% | 67% | 78% | 84% | 78% | 75% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 175% | 68% | 75% | 65% | 111% | 69% | 70% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-4-87 1ST QTR | MSMW-4-87 2ND QTR | MSMW-4-87 3RD QTR | MSMW-4-87 3RD QTR QC-REPEAT | MSMW-5-87 1ST QTR | MSMW-5-87 2ND QTR | MSMW-5-87 3RD QTR |
|--------------------------------|----------------|----------------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | 0.7 | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | 1.1 | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | 15.6 | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 2.2 | 1.5 | 1.6 | ND | 42.6 | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 1.0 | 1.4 | 370.0 | 1.3 | ND | ND | 1.3 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-4-87 | MSMW-4-87 | MSMW-4-87 | MSMW-4-87 | MSMW-5-87 | MSMW-5-87 | MSMW-5-87 |
|--------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | UG/L | 1ST QTR | 2ND QTR | 3RD QTR | 3RD QTR | 1ST QTR | 2ND QTR | 3RD QTR |
| QC-REPEAT | | | | | | | | |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | 1.4 | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 56% | 13% | 6% | 87% | 93% | 57% | 78% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 73% | 21% | 6% | 73% | 96% | 61% | 89% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 65% | 70% | 31% | 69% | 82% | 101% | 68% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. US/L | MSMW-6-87 1ST QTR | MSMW-6-87 2ND QTR | MSMW-6-87 2ND QTR DUPLICATE | MSMW-6-87 3RD QTR | MSMW-7-87 1ST QTR | MSMW-7-87 2ND QTR | MSMW-7-87 3RD QTR |
|--------------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | 0.8 | ND | ND | ND | ND | 0.6 | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | \$1.1 | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | \$1.1 | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 1.4 | ND | 1.9 | ND | 3.1 | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | \$1.6 | ND | ND | ND | 2.9 | \$1.6 | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-87 1ST QTR | MSMW-6-87 2ND QTR | MSMW-6-87 2ND QTR DUPLICATE | MSMW-6-87 3RD QTR | MSMW-7-87 1ST QTR | MSMW-7-87 2ND QTR | MSMW-7-87 3RD QTR |
|---------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ‡.6 | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|-----|-----|------|------|-----|-----|------|
| 48 NITROBENZENE-D5 | 50 UG/L | 57% | 41% | 64% | 38% | 55% | 74% | 105% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 79% | 43% | 69% | 73% | 62% | 76% | 78% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 56% | 92% | 116% | 109% | 79% | 72% | 92% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-8-87 1ST QTR | MSMW-8-87 2ND QTR | MSMW-8-87 2ND QTR QC-REPEAT | MSMW-8-87 3RD QTR | MSMW-9-87 1ST QTR | MSMW-9-87 1ST QTR DUPLICATE | MSMW-9-87 2ND QTR |
|--------------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|----------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | 0.8 | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | 1.1 | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 1.9 | ND | ND | 3.7 | 35.2 | 26.6 | 1.5 |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | 1.5 | 1.4 | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 1.7 | ND | ND | 4.8 | 1.7 | 1.6 | 4.3 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED * = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-8-87 1ST QTR | MSMW-8-87 2ND QTR | MSMW-8-87 2ND QTR GC-REPEAT | MSMW-8-87 3RD QTR | MSMW-9-87 1ST QTR | MSMW-9-87 1ST QTR DUPLICATE | MSMW-9-87 2ND QTR |
|--------------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|----------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | 1.7 | ND | ND | ND | ND | 1.8 | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 59% | 62% | 14% | 101% | 74% | 92% | 60% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 80% | 66% | 21% | 84% | 95% | 101% | 63% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 42% | 114% | 142% | 40% | 240% | 72% | 118% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-9-87 3RD QTR | MSMW-10-87 1ST QTR | MSMW-10-87 2ND QTR | MSMW-10-87 3RD QTR | MSMW-11-87 1ST QTR | MSMW-11-87 2ND QTR | MSMW-11-87 3RD QTR |
|--------------------------------|----------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | 0.8 | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | 3.0 | ND | ND | 19.7 | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 5.8 | 8.8 | ND | 8.7 | ND | ND | 1.3 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-9-87 3RD QTR | MSMW-10-87 1ST QTR | MSMW-10-87 2ND QTR | MSMW-10-87 3RD QTR | MSMW-11-87 1ST QTR | MSMW-11-87 2ND QTR | MSMW-11-87 3RD QTR |
|---------------------------|----------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|------|------|------|------|-----|-----|-----|
| 49 NITROBENZENE-D5 | 50 UG/L | 66% | 64% | 52% | 117% | 85% | 11% | 75% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 62% | 69% | 53% | 102% | 94% | 15% | 78% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 131% | 176% | 129% | 28% | 68% | 49% | 79% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-12-87 | MSMW-12-87 | MSMW-12-87 | MSMW-12-87 | MSMW-13-87 | MSMW-13-87 | MSMW-13-87 |
|--------------------------------|----------------|----------------------|------------|------------|----------------------|------------|----------------------|------------|
| | | 1ST QTR LOST SAMP | 2ND QTR | 3RD QTR | 3RD QTR QC-REPEAT | 1ST QTR | 1ST QTR QC-REPEAT | 2ND QTR |
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | | 0.5 | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | | 0.5 | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | | ND | ND | ND | ND | ND | 0.7 |
| 18 ACENAPHTHYLENE | .5 | | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | | ND | ND | ND | 34.8 | 22.2 | ND |
| 33 FLUORANTHENE | .5 | | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | | ND | 1.9 | 1.3 | 1.6 | 11.6 | 1.6 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED * = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-12-87 | MSMW-12-87 | MSMW-12-87 | MSMW-12-87 | MSMW-13-87 | MSMW-13-87 | MSMW-13-87 |
|--------------------------------|---------|----------------------|------------|------------|----------------------|------------|----------------------|------------|
| | UG/L | 1ST QTR LOST SAMP | 2ND QTR | 3RD QTR | 3RD QTR QC-REPEAT | 1ST QTR | 1ST QTR QC-REPEAT | 2ND QTR |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | | ND | ND | ND | ND | 4.2 | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | | AMOUNT | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | | 48% | 61% | 92% | 79% | 57% | 86% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | | 56% | 64% | 70% | 84% | 65% | 82% |
| 50 4-TERPHENYL-D14 | 50 UG/L | | 94% | 123% | 101% | 99% | 69% | 110% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-13-87 3RD QTR | MSMW-14-87 1ST QTR | MSMW-14-87 2ND QTR | MSMW-14-87 3RD QTR | MSMW-15-87 1ST QTR | MSMW-15-87 2ND QTR | MSMW-15-87 4TH QTR |
|--------------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | 48.9 | ND | ND | 1.8 | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 126.0 | 81.2 | ND | 7.9 | ND | ND | 8.9 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-13-87 3RD QTR | MSMW-14-87 1ST QTR | MSMW-14-87 2ND QTR | MSMW-14-87 3RD QTR | MSMW-15-87 1ST QTR | MSMW-15-87 2ND QTR | MSMW-15-87 4TH QTR |
|--------------------------------|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ‡.7 | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 74% | 121% | 44% | 92% | 64% | 73% | 63% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 65% | 120% | 50% | 72% | 65% | 63% | 70% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 102% | 136% | 122% | 101% | 158% | 97% | 70% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-15-87 | MSMW-15-87 |
|--------------------------------|----------------|----------------------|----------------------|
| | | 4TH QTR QC-REPEAT | 4TH QTR DUPLICATE |
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND |
| 23 FLUORENE | .5 | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND |
| 35 PYRENE | .5 | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | ND | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-15-87 | MSMW-15-87 |
|--------------------------------|---------|------------|------------|
| | UG/L | 4TH QTR | 4TH QTR |
| | | QC-REPEAT | DUPLICATE |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 79% | 65% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 76% | 75% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 110% | 113% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 97-39-01 | 87-39-01 | P8-86 | P10-87-8LF | CITYW | CITYW | DIW |
|--------------------------------|----------------|------------------|----------------------|------------------|------------------|------------------|----------------------|------------------|
| | | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC |
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 41.3 | 45.3 | 2.2 | 12.5 | 8.6 | 19.2 | 1.2 |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | 4.3 | 6.5 | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 6.6 | 4.2 | 2.5 | 8.4 | ND | 1.1 | 8.4 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 87-39-01 | 87-39-01 | P8-86 | P10-87-BLF | CITYM | CITYM | DIW |
|---------------------------|----------------|------------------|----------------------|------------------|------------------|------------------|----------------------|------------------|
| | | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | 7.3 | 18.1 | 4.9 | ND | ND | 12.3 | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|-----|-----|-----|-----|------|-----|-----|
| 48 NITROBENZENE-D5 | 50 UG/L | 67% | 69% | 35% | 84% | 86% | 56% | 67% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 63% | 67% | 64% | 92% | 88% | 62% | 68% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 69% | 65% | 75% | 91% | 119% | 86% | 74% |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES

| | COMPOUND | AMOUNT UG/L | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR | REAGENT BLANK#4 1ST QTR | REAGENT BLANK#5 1ST QTR | REAGENT BLANK#6 1ST QTR | REAGENT BLANK#7 1ST QTR |
|----|-----------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 | BIS(2-CHLOROETHYL)ETHER | 50.0 | 60 | 48 | 82 | 75 | 64 | 89 | 96 |
| 2 | 1,3-DICHLOROBENZENE | 50.0 | 39 | 53 | 73 | 66 | 60 | 82 | 91 |
| 3 | 1,4-DICHLOROBENZENE | 50.0 | 42 | 53 | 73 | 68 | 60 | 82 | 91 |
| 4 | 1,2-DICHLOROBENZENE | 50.0 | 45 | 53 | 76 | 71 | 62 | 85 | 93 |
| 5 | BIS(2-CHLOROISOPROPYL)ETHER | 50.0 | 65 | 54 | 84 | 79 | 63 | 91 | 87 |
| 6 | HEXACHLOROETHANE | 50.0 | 32 | 48 | 58 | 61 | 61 | 84 | 91 |
| 7 | N-NITROSODI-N-PROPYLAMINE | 50.0 | 61 | 55 | 91 | 88 | 62 | 91 | 90 |
| 8 | NITROBENZENE | 50.0 | 67 | 50 | 81 | 81 | 67 | 91 | 101 |
| 9 | ISOPHORONE | 50.0 | 70 | 73 | 121 | 85 | 74 | 106 | 108 |
| 10 | BIS(2-CHLOROETHOXY)METHANE | 50.0 | 59 | 25 | 71 | 76 | 65 | 90 | 99 |
| 11 | 1,2,4-TRICHLOROBENZENE | 50.0 | 44 | 62 | 80 | 76 | 64 | 90 | 97 |
| 12 | NAPHTHALENE | 50.0 | 60 | 54 | 81 | 81 | 66 | 90 | 99 |
| 13 | HEXACHLOROBUTADIENE | 50.0 | 33 | 52 | 57 | 66 | 62 | 86 | 89 |
| 14 | 2-METHYLNAPHTHALENE | 50.0 | 51 | 54 | 72 | 82 | 72 | 89 | 97 |
| 15 | 1-METHYLNAPHTHALENE | 50.0 | | | | 86 | 75 | 90 | 99 |
| 16 | HEXACHLOROCYCLOPENTADIENE | 50.0 | 34 | 40 | 49 | 49 | 47 | 55 | 55 |
| 17 | 2-CHLORONAPHTHALENE | 50.0 | 60 | 68 | 98 | 84 | 81 | 88 | 94 |
| 18 | ACENAPHTHYLENE | 50.0 | 63 | 61 | 100 | 81 | 83 | 89 | 97 |
| 19 | DIMETHYL PHTHALATE | 50.0 | 14 | 11 | 8 | 54 | 91 | 91 | 96 |
| 20 | 2,6-DINITROTOLUENE | 50.0 | 80 | 75 | 121 | 82 | 94 | 103 | 75 |
| 21 | ACENAPHTHENE | 50.0 | 64 | 63 | 94 | 82 | 83 | 91 | 93 |
| 22 | 2,4-DINITROTOLUENE | 50.0 | 66 | 64 | 109 | 67 | 96 | 97 | 110 |
| 23 | FLUORENE | 50.0 | 66 | 66 | 102 | 82 | 93 | 91 | 97 |
| 24 | 4-CHLOROPHENYL PHENYL ETHER | 50.0 | 65 | 68 | 90 | 80 | 94 | 92 | 91 |
| 25 | DIETHYL PHTHALATE | 50.0 | 43 | 34 | 12 | 72 | 103 | 95 | 102 |
| 26 | N-NITROSODIPHENYLAMINE | 50.0 | 60 | 70 | 107 | 66 | 80 | 93 | 100 |
| 27 | AZOBENZENE | 50.0 | 70 | 65 | 95 | 79 | 99 | 97 | 99 |
| 28 | 4-BROMOPHENYL PHENYL ETHER | 50.0 | 64 | 59 | 90 | 72 | 93 | 89 | 110 |
| 29 | HEXACHLOROBENZENE | 50.0 | 64 | 80 | 104 | 79 | 98 | 95 | 119 |
| 30 | PHENANTHRENE | 50.0 | 69 | 72 | 111 | 77 | 102 | 95 | 92 |
| 31 | ANTHRACENE | 50.0 | 74 | 68 | 100 | 74 | 99 | 85 | 86 |
| 32 | DI-N-BUTYL PHTHALATE | 50.0 | 18 | 71 | 45 | 78 | 230 | 104 | 218 |
| 33 | FLUORANTHENE | 50.0 | 75 | 81 | 119 | 90 | 102 | 101 | 90 |
| 34 | BENZIDINE | 50.0 | <1 | 2 | 3 | | | | |
| 35 | PYRENE | 50.0 | 72 | 77 | 115 | 102 | 95 | 100 | 72 |
| 36 | BENZYL BUTYL PHTHALATE | 50.0 | 58 | 50 | 51 | 92 | 168 | 96 | 112 |
| 37 | BENZO(A)ANTHRACENE | 50.0 | 67 | 128 | 185 | 96 | 100 | 102 | 92 |
| 38 | CHRYSENE | 50.0 | 73 | 92 | 127 | 83 | 103 | 108 | 86 |
| 39 | 3,3'-DICHLOROBENZIDINE | 50.0 | 50 | 242 | 270 | | | | |
| 40 | BIS(2-ETHYLHEXYL)PHTHALATE | 50.0 | 72 | 89 | 151 | 118 | 145 | 96 | 135 |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES (CONTINUED)

| COMPOUND | AMOUNT UG/L | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR | REAGENT BLANK#4 1ST QTR | REAGENT BLANK#5 1ST QTR | REAGENT BLANK#6 1ST QTR | REAGENT BLANK#7 1ST QTR |
|---------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 41 DI-N-OCTYL PHTHALATE | 50.0 | 79 | 91 | 124 | 130 | 89 | 103 | 77 |
| 42 BENZO(B)FLUORANTHENE | 50.0 | 71 | 108 | 164 | 96 | 62 | 101 | 76 |
| 43 BENZO(K)FLUORANTHENE | 50.0 | 76 | 94 | 129 | 76 | 71 | 102 | 82 |
| 44 BENZO(A)PYRENE | 50.0 | 65 | 102 | 157 | 90 | 60 | 108 | 67 |
| 45 INDENO(1,2,3-CD)PYRENE | 50.0 | 64 | 114 | 162 | 98 | 58 | 122 | 61 |
| 46 DIBENZO(A,H)ANTHRACENE | 50.0 | 68 | 116 | 169 | 79 | 57 | 115 | 61 |
| 47 BENZO(GHI)PERYLENE | 50.0 | 69 | 110 | 159 | 73 | 54 | 107 | 62 |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|---------------------|---------|----|----|----|-----|----|----|----|
| 48 NITROBENZENE-D5 | 50 UG/L | 58 | 41 | 60 | 73 | 61 | 88 | 94 |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 58 | 58 | 78 | 78 | 72 | 88 | 92 |
| 50 4-TERPHENYL-D14 | 50 UG/L | 63 | 62 | 76 | 106 | 85 | 96 | 88 |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES

| | COMPOUND | AMOUNT UG/L | MSMW-1-85 1ST QTR DUPLICATE | MSMW-4-85 1ST QTR | MSMW-10-87 1ST QTR | MSMW-11-87 1ST QTR | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR |
|----|-----------------------------|----------------|-----------------------------------|----------------------|-----------------------|-----------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 | BIS(2-CHLOROETHYL)ETHER | 50.0 | 100 | 60 | 82 | 107 | 67 | 79 | 82 |
| 2 | 1,3-DICHLOROBENZENE | 50.0 | 96 | 54 | 81 | 106 | 55 | 65 | 68 |
| 3 | 1,4-DICHLOROBENZENE | 50.0 | 96 | 55 | 83 | 107 | 56 | 67 | 70 |
| 4 | 1,2-DICHLOROBENZENE | 50.0 | 100 | 57 | 84 | 108 | 58 | 69 | 73 |
| 5 | BIS(2-CHLOROISOPROPYL)ETHER | 50.0 | 100 | 60 | 86 | 100 | 61 | 74 | 77 |
| 6 | HEXACHLOROETHANE | 50.0 | 98 | 53 | 85 | 103 | 59 | 61 | 69 |
| 7 | N-NITROSODI-N-PROPYLAMINE | 50.0 | 95 | 57 | 93 | 91 | 59 | 79 | 71 |
| 8 | NITROBENZENE | 50.0 | 103 | 62 | 88 | 106 | 72 | 80 | 83 |
| 9 | ISOPHORONE | 50.0 | 107 | 71 | 97 | 112 | 82 | 86 | 90 |
| 10 | BIS(2-CHLOROETHOXY)METHANE | 50.0 | 94 | 62 | 85 | 104 | 74 | 77 | 84 |
| 11 | 1,2,4-TRICHLOROBENZENE | 50.0 | 96 | 59 | 90 | 104 | 59 | 65 | 67 |
| 12 | NAPHTHALENE | 50.0 | 98 | 61 | 92 | 104 | 64 | 75 | 80 |
| 13 | HEXACHLOROBUTADIENE | 50.0 | 96 | 56 | 91 | 102 | 66 | 54 | 60 |
| 14 | 2-METHYLNAPHTHALENE | 50.0 | 96 | 66 | 100 | 122 | 67 | 75 | 77 |
| 15 | 1-METHYLNAPHTHALENE | 50.0 | 98 | 69 | 96 | 109 | 67 | 78 | 83 |
| 16 | HEXACHLOROCYCLOPENTADIENE | 50.0 | 74 | 47 | 58 | 60 | 56 | 38 | 43 |
| 17 | 2-CHLORONAPHTHALENE | 50.0 | 97 | 74 | 96 | 118 | 73 | 78 | 82 |
| 18 | ACENAPHTHYLENE | 50.0 | 96 | 76 | 92 | 120 | 77 | 80 | 86 |
| 19 | DIMETHYL PHTHALATE | 50.0 | 87 | 70 | 92 | 122 | 91 | 73 | 72 |
| 20 | 2,6-DINITROTOLUENE | 50.0 | 85 | 88 | 97 | 120 | 92 | 77 | 85 |
| 21 | ACENAPHTHENE | 50.0 | 93 | 78 | 98 | 121 | 74 | 77 | 84 |
| 22 | 2,4-DINITROTOLUENE | 50.0 | 74 | 100 | 78 | 99 | 98 | 75 | 88 |
| 23 | FLUORENE | 50.0 | 91 | 88 | 102 | 127 | 83 | 78 | 82 |
| 24 | 4-CHLOROPHENYL PHENYL ETHER | 50.0 | 92 | 89 | 102 | 138 | 91 | 75 | 80 |
| 25 | DIETHYL PHTHALATE | 50.0 | 91 | 89 | 97 | 133 | 91 | 78 | 83 |
| 26 | N-NITROSODIPHENYLAMINE | 50.0 | 64 | 65 | 50 | 72 | 84 | 67 | 85 |
| 27 | AZOBIENZENE | 50.0 | 92 | 93 | 91 | 126 | 101 | 82 | 94 |
| 28 | 4-BROMOPHENYL PHENYL ETHER | 50.0 | 85 | 85 | 95 | 119 | 94 | 78 | 88 |
| 29 | HEXACHLOROBENZENE | 50.0 | 90 | 97 | 96 | 118 | 102 | 77 | 85 |
| 30 | PHENANTHRENE | 50.0 | 98 | 103 | 88 | 105 | 97 | 85 | 91 |
| 31 | ANTHRACENE | 50.0 | 85 | 95 | 83 | 96 | 92 | 80 | 83 |
| 32 | DI-N-BUTYL PHTHALATE | 50.0 | 96 | 97 | 75 | 129 | 35 | 86 | 87 |
| 33 | FLUORANTHENE | 50.0 | 71 | 113 | 72 | 92 | 59 | 94 | 75 |
| 34 | BENZIDINE | 50.0 | | | | | | | |
| 35 | PYRENE | 50.0 | 70 | 106 | 79 | 92 | 50 | 7 | 79 |
| 36 | BENZYL BUTYL PHTHALATE | 50.0 | 160 | 131 | 89 | 120 | 99 | 74 | 99 |
| 37 | BENZO(A)ANTHRACENE | 50.0 | 109 | 103 | 95 | 94 | 96 | 90 | 102 |
| 38 | CHRYSENE | 50.0 | 109 | 95 | 95 | 96 | 95 | 83 | 109 |
| 39 | 3,3'-DICHLOROBENZIDINE | 50.0 | | | | | | | |
| 40 | BIS(2-ETHYLHEXYL)PHTHALATE | 50.0 | 134 | 129 | 111 | 99 | | 67 | 105 |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES (CONTINUED)

| COMPOUND | AMOUNT UG/L | MSMW-1-85 1ST QTR DUPLICATE | MSMW-4-85 1ST QTR | MSMW-10-87 1ST QTR | MSMW-11-87 1ST QTR | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR |
|--------------------------------|----------------|-----------------------------------|----------------------|-----------------------|-----------------------|-------------------------------|-------------------------------|-------------------------------|
| 41 DI-N-OCTYL PHTHALATE | 50.0 | 105 | 92 | 99 | 63 | 69 | 93 | 104 |
| 42 BENZO(B)FLUORANTHENE | 50.0 | 81 | 64 | 82 | 61 | 51 | 117 | 122 |
| 43 BENZO(K)FLUORANTHENE | 50.0 | 99 | 75 | 70 | 76 | 48 | 97 | 98 |
| 44 BENZO(A)PYRENE | 50.0 | 86 | 67 | 74 | 58 | 49 | 123 | 120 |
| 45 INDENO(1,2,3-CD)PYRENE | 50.0 | 77 | 65 | 81 | 63 | 52 | 146 | 145 |
| 46 DIBENZO(A,H)ANTHRACENE | 50.0 | 81 | 63 | 68 | 72 | 53 | 138 | 140 |
| 47 BENZO(GHI)PERYLENE | 50.0 | 69 | 56 | 68 | 79 | 52 | 109 | 152 |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 93 | 57 | 83 | 80 | 63 | 74 | 80 |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 89 | 66 | 94 | 88 | 65 | 75 | 82 |
| 50 4-TERPHENYL-D14 | 50 UG/L | 59 | 104 | 84 | 78 | 55 | 119 | 84 |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

± = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-16-87 | MSMW-16-87 | MSMW-16-87 | MSMW-16-87 |
|--------------------------------|----------------|------------------|------------------|----------------------|----------------------|
| | | 2ND QTR QA/QC | 3RD QTR QA/QC | 3RD QTR DUPLICATE | 3RD QTR DUPL(RPT) |
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 2.4 | ND | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | ±.9 | 1.3 | ND | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

: = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-16-87 | MSMW-16-87 | MSMW-16-87 | MSMW-16-87 |
|---------------------------|----------------|------------------|------------------|----------------------|----------------------|
| | | 2ND QTR QA/QC | 3RD QTR QA/QC | 3RD QTR DUPLICATE | 3RD QTR DUPL(RPT) |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND |
| 47 BENZO(GH)PERYLENE | 2.0 | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | |
|---------------------|---------|-----|------|------|------|
| 48 NITROBENZENE-D5 | 50 UG/L | 34% | 44% | 69% | 137% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 48% | 46% | 76% | 179% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 89% | 124% | 109% | 131% |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES

| | COMPOUND | AMOUNT UG/L | REAGENT BLANK#4 2ND QTR | REAGENT BLANK#5 2ND QTR | MSMW-4-85 2ND QTR | MSMW-7-85 2ND QTR | MSMW-5-87 2ND QTR | MSMW-16-87 2ND QTR | REAGENT BLANK#1 3RD QTR |
|----|-----------------------------|----------------|-------------------------------|-------------------------------|----------------------|----------------------|----------------------|-----------------------|-------------------------------|
| 1 | BIS(2-CHLOROETHYL)ETHER | 50.0 | 80 | 57 | 87 | 56 | 61 | 80 | 43 |
| 2 | 1,3-DICHLOROBENZENE | 50.0 | 69 | 47 | 75 | 48 | 47 | 65 | 42 |
| 3 | 1,4-DICHLOROBENZENE | 50.0 | 70 | 50 | 75 | 49 | 49 | 67 | 41 |
| 4 | 1,2-DICHLOROBENZENE | 50.0 | 70 | 52 | 79 | 48 | 53 | 68 | 44 |
| 5 | BIS(2-CHLOROISOPROPYL)ETHER | 50.0 | 77 | 60 | 84 | 51 | 62 | 72 | 46 |
| 6 | HEXACHLOROETHANE | 50.0 | 67 | 46 | 72 | 47 | 48 | 67 | 46 |
| 7 | N-NITROSODI-N-PROPYLAMINE | 50.0 | 76 | 51 | 82 | 49 | 73 | 67 | 41 |
| 8 | NITROBENZENE | 50.0 | 81 | 65 | 91 | 55 | 69 | 81 | 52 |
| 9 | ISOPHORONE | 50.0 | 93 | 74 | 97 | 61 | 97 | 89 | 59 |
| 10 | BIS(2-CHLOROETHOXY)METHANE | 50.0 | 82 | 66 | 87 | 52 | 75 | 80 | 40 |
| 11 | 1,2,4-TRICHLOROBENZENE | 50.0 | 69 | 57 | 72 | 47 | 63 | 69 | 43 |
| 12 | NAPHTHALENE | 50.0 | 79 | 64 | 81 | 51 | 64 | 71 | 37 |
| 13 | HEXACHLOROBUTADIENE | 50.0 | 59 | 48 | 62 | 46 | 64 | 67 | 40 |
| 14 | 2-METHYLNAPHTHALENE | 50.0 | 73 | 65 | 75 | 53 | 72 | 80 | 41 |
| 15 | 1-METHYLNAPHTHALENE | 50.0 | 85 | 71 | 88 | 57 | 74 | 81 | 48 |
| 16 | HEXACHLOROCYCLOPENTADIENE | 50.0 | 44 | 41 | 42 | 33 | 63 | 48 | 46 |
| 17 | 2-CHLORONAPHTHALENE | 50.0 | 79 | 70 | 83 | 57 | 77 | 79 | 50 |
| 18 | ACENAPHTHYLENE | 50.0 | 83 | 75 | 86 | 61 | 90 | 87 | 46 |
| 19 | DIMETHYL PHTHALATE | 50.0 | 61 | 53 | 87 | 57 | 97 | 63 | 44 |
| 20 | 2,6-DINITROTOLUENE | 50.0 | 91 | 82 | 91 | 67 | 108 | 89 | 62 |
| 21 | ACENAPHTHENE | 50.0 | 85 | 77 | 87 | 62 | 86 | 83 | 43 |
| 22 | 2,4-DINITROTOLUENE | 50.0 | 93 | 80 | 98 | 76 | 117 | 88 | 58 |
| 23 | FLUORENE | 50.0 | 85 | 80 | 90 | 68 | 97 | 88 | 47 |
| 24 | 4-CHLOROPHENYL PHENYL ETHER | 50.0 | 85 | 81 | 87 | 66 | 104 | 90 | 46 |
| 25 | DIETHYL PHTHALATE | 50.0 | 82 | 72 | 92 | 67 | 104 | 82 | 46 |
| 26 | N-NITROSODIPHENYLAMINE | 50.0 | 88 | 73 | 84 | 61 | 91 | 71 | 47 |
| 27 | AZO BENZENE | 50.0 | 92 | 83 | 106 | 73 | 99 | 91 | 58 |
| 28 | 4-BROMOPHENYL PHENYL ETHER | 50.0 | 85 | 79 | 102 | 72 | 97 | 92 | 41 |
| 29 | HEXACHLOROBENZENE | 50.0 | 88 | 84 | 105 | 84 | 127 | 81 | 52 |
| 30 | PHENANTHRENE | 50.0 | 74 | 87 | 79 | 85 | 113 | 91 | 49 |
| 31 | ANTHRACENE | 50.0 | 69 | 86 | 82 | 82 | 107 | 89 | 40 |
| 32 | DI-N-BUTYL PHTHALATE | 50.0 | 82 | 82 | 93 | 81 | 129 | 82 | 44 |
| 33 | FLUORANTHENE | 50.0 | 89 | 88 | 94 | 57 | 141 | 67 | 40 |
| 34 | BENZIDINE | 50.0 | | | | | | | |
| 35 | PYRENE | 50.0 | 91 | 90 | 98 | 52 | 141 | 60 | 41 |
| 36 | BENZYL BUTYL PHTHALATE | 50.0 | 64 | 98 | 86 | 97 | 188 | 156 | 59 |
| 37 | BENZID(A)ANTHRACENE | 50.0 | 85 | 98 | 89 | 111 | 138 | 99 | 37 |
| 38 | CHRYSENE | 50.0 | 86 | 106 | 98 | 113 | 114 | 103 | 51 |
| 39 | 3,3'-DICHLOROBENZIDINE | 50.0 | | | | | | | 17 |
| 40 | BIS(2-ETHYLHEXYL)PHTHALATE | 50.0 | 77 | 111 | 83 | 92 | 177 | 123 | |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES (CONTINUED)

| | COMPOUND | AMOUNT UG/L | REAGENT BLANK#4 2ND QTR | REAGENT BLANK#5 2ND QTR | MSMW-4-85 2ND QTR | MSMW-7-85 2ND QTR | MSMW-5-87 2ND QTR | MSMW-16-87 2ND QTR | REAGENT BLANK#1 3RD QTR |
|--------------------------------|------------------------|----------------|-------------------------------|-------------------------------|----------------------|----------------------|----------------------|-----------------------|-------------------------------|
| 41 | DI-N-OCTYL PHTHALATE | 50.0 | 75 | 115 | 128 | 86 | 180 | 79 | 63 |
| 42 | BENZO(B)FLUORANTHENE | 50.0 | 98 | 101 | 103 | 108 | 98 | 71 | 68 |
| 43 | BENZO(K)FLUORANTHENE | 50.0 | 83 | 97 | 111 | 103 | 77 | 85 | 75 |
| 44 | BENZO(A)PYRENE | 50.0 | 90 | 101 | 105 | 104 | 92 | 71 | 58 |
| 45 | INDENO(1,2,3-CD)PYRENE | 50.0 | 75 | 86 | 78 | 95 | 116 | 53 | 57 |
| 46 | DIBENZO(A,H)ANTHRACENE | 50.0 | 76 | 96 | 76 | 102 | 113 | 74 | 51 |
| 47 | BENZO(GHI)PERYLENE | 50.0 | 82 | 89 | 73 | 100 | 102 | 73 | 55 |
| SURROGATE STANDARD RECOVERIES: | | AMOUNT | | | | | | | |
| 48 | NITROBENZENE-D5 | 50 UG/L | 76 | 110 | 85 | 53 | 39 | 78 | 61 |
| 49 | 2-FLUOROBIPHENYL | 50 UG/L | 83 | 81 | 82 | 56 | 49 | 79 | 60 |
| 50 | 4-TERPHENYL-D14 | 50 UG/L | 111 | 61 | 111 | 49 | 110 | 57 | 22 |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES

| | COMPOUND | AMOUNT UG/L | REAGENT BLANK#2 3RD QTR | MSMW-3-85 3RD QTR | MSMW-1-86 3RD QTR | MSMW-9-87 3RD QTR | REAGENT BLANK#1 4TH QTR |
|----|-----------------------------|----------------|-------------------------------|----------------------|----------------------|----------------------|-------------------------------|
| 1 | BIS(2-CHLOROETHYL)ETHER | 50.0 | 42 | 68 | 68 | 95 | 51 |
| 2 | 1,3-DICHLOROBENZENE | 50.0 | 46 | 64 | 68 | 75 | 44 |
| 3 | 1,4-DICHLOROBENZENE | 50.0 | 48 | 68 | 69 | 77 | 48 |
| 4 | 1,2-DICHLOROBENZENE | 50.0 | 48 | 70 | 72 | 78 | 52 |
| 5 | BIS(2-CHLOROISOPROPYL)ETHER | 50.0 | 43 | 65 | 66 | 81 | 50 |
| 6 | HEXACHLOROETHANE | 50.0 | 39 | 71 | 59 | 83 | 43 |
| 7 | N-NITROSODI-N-PROPYLAMINE | 50.0 | 46 | 61 | 62 | 184 | 42 |
| 8 | NITROBENZENE | 50.0 | 46 | 80 | 61 | 108 | 63 |
| 9 | ISOPHORONE | 50.0 | 49 | 88 | 75 | 112 | 74 |
| 10 | BIS(2-CHLOROETHOXY)METHANE | 50.0 | 49 | 65 | 51 | 78 | 57 |
| 11 | 1,2,4-TRICHLOROBENZENE | 50.0 | 43 | 68 | 59 | 70 | 57 |
| 12 | NAPHTHALENE | 50.0 | 25 | 66 | 51 | 69 | 56 |
| 13 | HEXACHLOROBUTADIENE | 50.0 | 35 | 66 | 51 | 66 | 47 |
| 14 | 2-METHYLNAPHTHALENE | 50.0 | 44 | 76 | 55 | 68 | 36 |
| 15 | 1-METHYLNAPHTHALENE | 50.0 | 47 | 78 | 69 | 79 | 40 |
| 16 | HEXACHLOROCYCLOPENTADIENE | 50.0 | 23 | 49 | 32 | 32 | 37 |
| 17 | 2-CHLORONAPHTHALENE | 50.0 | 47 | 80 | 67 | 78 | 72 |
| 18 | ACENAPHTHYLENE | 50.0 | 44 | 72 | 54 | 67 | 70 |
| 19 | DIMETHYL PHTHALATE | 50.0 | 35 | 69 | 51 | 60 | 31 |
| 20 | 2,6-DINITROTOLUENE | 50.0 | 58 | 100 | 58 | 82 | 92 |
| 21 | ACENAPHTHENE | 50.0 | 47 | 72 | 54 | 64 | 72 |
| 22 | 2,4-DINITROTOLUENE | 50.0 | 68 | 109 | 68 | 84 | 80 |
| 23 | FLUORENE | 50.0 | 50 | 77 | 59 | 68 | 80 |
| 24 | 4-CHLOROPHENYL PHENYL ETHER | 50.0 | 54 | 73 | 55 | 66 | 76 |
| 25 | DIETHYL PHTHALATE | 50.0 | 41 | 77 | 60 | 63 | 43 |
| 26 | N-NITROSODIPHENYLAMINE | 50.0 | 58 | 80 | 60 | 56 | 89 |
| 27 | AZO BENZENE | 50.0 | 49 | 103 | 71 | 86 | 99 |
| 28 | 4-BROMOPHENYL PHENYL ETHER | 50.0 | 42 | 86 | 58 | 67 | 78 |
| 29 | HEXACHLOROBENZENE | 50.0 | 79 | 91 | 69 | 76 | 82 |
| 30 | PHENANTHRENE | 50.0 | 65 | 84 | 69 | 68 | 78 |
| 31 | ANTHRACENE | 50.0 | 63 | 75 | 67 | 63 | 81 |
| 32 | 31-N-BUTYL PHTHALATE | 50.0 | 54 | 69 | 57 | 73 | 71 |
| 33 | FLUORANTHENE | 50.0 | 83 | 82 | 62 | 62 | 70 |
| 34 | BENZIDINE | 50.0 | | | | | |
| 35 | PYRENE | 50.0 | 89 | 78 | 57 | 76 | 71 |
| 36 | BENZYL BUTYL PHTHALATE | 50.0 | 64 | 99 | 67 | 96 | 129 |
| 37 | BENZO(A)ANTHRACENE | 50.0 | 80 | 91 | 87 | 82 | 94 |
| 38 | CHRYSENE | 50.0 | 90 | 85 | 88 | 79 | 99 |
| 39 | 3,3'-DICHLOROBENZIDINE | 50.0 | 47 | 32 | 44 | 29 | 47 |
| 40 | BIS(2-ETHYLHEXYL)PHTHALATE | 50.0 | 73 | 115 | 62 | 81 | 134 |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES (CONTINUED)

| COMPOUND | AMOUNT | REAGENT | MSMW-3-85 | MSMW-1-86 | MSMW-9-87 | REAGENT |
|--------------------------------|---------|---------|-----------|-----------|-----------|---------|
| | US/L | BLANK#2 | 3RD QTR | 3RD QTR | 3RD QTR | BLANK#1 |
| | | 3RD QTR | | | | 4TH QTR |
| 41 DI-N-OCTYL PHTHALATE | 50.0 | 72 | 107 | 47 | 77 | 91 |
| 42 BENZO(B)FLUORANTHENE | 50.0 | 80 | 105 | 82 | 77 | 51 |
| 43 BENZO(K)FLUORANTHENE | 50.0 | 70 | 84 | 89 | 67 | 59 |
| 44 BENZO(A)PYRENE | 50.0 | 78 | 102 | 89 | 71 | 53 |
| 45 INDENO(1,2,3-CD)PYRENE | 50.0 | 90 | 136 | 65 | 70 | 50 |
| 46 DIBENZO(A,H)ANTHRACENE | 50.0 | 77 | 108 | 75 | 67 | 58 |
| 47 BENZO(GHI)PERYLENE | 50.0 | 89 | 114 | 98 | 74 | 57 |
| SURROGATE STANDARD RECOVERIES: | | | | | | |
| | AMOUNT | | | | | |
| 48 NITROBENZENE-D5 | 50 US/L | 44 | 79 | 78 | 97 | 56 |
| 49 2-FLUOROBIPHENYL | 50 US/L | 49 | 76 | 84 | 70 | 73 |
| 50 4-TERPHENYL-D14 | 50 US/L | 103 | 85 | 27 | 81 | 59 |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | FIELD BLANK#1 1ST QTR | FIELD BLANK#2 1ST QTR | FIELD BLANK#3 1ST QTR | FIELD BLANK#1 2ND QTR | FIELD BLANK#1 3RD QTR | FIELD BLANK#2 3RD QTR | FIELD BLANK#1 4TH QTR |
|--------------------------------|----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 2.2 | 17.3 | 17.3 | ND | ND | ND | 1.1 |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 11.0 | 1.6 | ND | 5.1 | 1.1 | ND | 1.0 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | FIELD | FIELD | FIELD | FIELD | FIELD | FIELD | FIELD |
|--------------------------------|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | BLANK#1 1ST QTR | BLANK#2 1ST QTR | BLANK#3 1ST QTR | BLANK#1 2ND QTR | BLANK#1 3RD QTR | BLANK#2 3RD QTR | BLANK#1 4TH QTR |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | 8.7 | 8.6 | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 42% | 85% | 58% | 23% | 93% | 142% | 84% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 80% | 92% | 69% | 35% | 74% | 297% | 76% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 63% | 110% | 113% | 84% | 99% | 99% | 98% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR | REAGENT BLANK#4 1ST QTR | REAGENT BLANK#5 1ST QTR | REAGENT BLANK#6 1ST QTR | REAGENT BLANK#7 1ST QTR |
|--------------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 54.5 | 1.9 | 11.1 | 2.8 | 25.8 | 2.1 | 15.0 |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | 9.9 |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 1.3 | 1.5 | 1.6 | 1.9 | 1.8 | 1.5 | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR | REAGENT BLANK#4 1ST QTR | REAGENT BLANK#5 1ST QTR | REAGENT BLANK#6 1ST QTR | REAGENT BLANK#7 1ST QTR |
|---------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | 4.0 | ND | ND | ND | ND | ND | 1.4 |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|-----|-----|-----|------|------|-----|-----|
| 48 NITROBENZENE-D5 | 50 UG/L | 81% | 39% | 82% | 72% | 53% | 64% | 72% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 74% | 63% | 89% | 72% | 58% | 65% | 94% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 59% | 40% | 83% | 136% | 104% | 73% | 88% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

1 = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#1 2ND QTR | REAGENT BLANK#2 2ND QTR | REAGENT BLANK#3 2ND QTR | REAGENT BLANK#4 2ND QTR | REAGENT BLANK#5 2ND QTR | REAGENT BLANK#6 2ND QTR | REAGENT BLANK#1 3RD QTR |
|--------------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 1.4 | 1.7 | ND | ND | ND | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 5.5 | 6.8 | ND | ND | 1.6 | ND | 3.8 |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#1 2ND QTR | REAGENT BLANK#2 2ND QTR | REAGENT BLANK#3 2ND QTR | REAGENT BLANK#4 2ND QTR | REAGENT BLANK#5 2ND QTR | REAGENT BLANK#6 2ND QTR | REAGENT BLANK#7 3RD QTR |
|---------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|-----|-----|-----|-----|-----|-----|------|
| 48 NITROBENZENE-D5 | 50 UG/L | 51% | 59% | 68% | 72% | 67% | 70% | 132% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 50% | 73% | 80% | 66% | 78% | 91% | 123% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 92% | 97% | 68% | 70% | 93% | 49% | 31% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#2 3RD QTR | REAGENT BLANK#3 3RD QTR | REAGENT BLANK#4 3RD QTR | REAGENT BLANK#5 3RD QTR | REAGENT BLANK#1 4TH QTR | REAGENT BLANK#2 4TH QTR |
|--------------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 1.1 | 1.8 | ND | ND | 1.1 | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#2 3RD QTR | REAGENT BLANK#3 3RD QTR | REAGENT BLANK#4 3RD QTR | REAGENT BLANK#5 3RD QTR | REAGENT BLANK#1 4TH QTR | REAGENT BLANK#2 4TH QTR |
|---------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | |
|---------------------|---------|------|-----|-----|------|------|-----|
| 48 NITROBENZENE-D5 | 50 UG/L | 92% | 61% | 53% | 44% | 115% | 41% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 66% | 79% | 62% | 65% | 103% | 42% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 104% | 81% | 80% | 106% | 62% | 60% |

APPENDIX G5

Fresh Water Aquifer
Acid Extractables

Analyses by:

Barringer-Magenta Ltd.
Rexdale, Ontario

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-1-85 1ST QTR | MSMW-1-85 1ST QTR DUPLICATE | MSMW-1-85 2ND QTR | MSMW-1-85 2ND QTR QC REPEAT | MSMW-1-85 3RD QTR | MSMW-3-85 2ND QTR | MSMW-3-85 2ND QTR QC REPEAT |
|-------------------------------|----------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|
| 1 PHENOL | .5 | ND | ND | 0.5 | 1.0 | ND | 0.9 | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|------|-----|-----|-----|-----|-----|----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 103% | 98% | 57% | 56% | 11% | 59% | 2% |
| 13 2,4,4-TRIBROMOPHENOL | 50 UG/L | 91% | 83% | 71% | 74% | 23% | 48% | |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

: = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-3-85 | MSMW-4-85 | MSMW-4-85 | MSMW-4-85 | MSMW-4-85 | MSMW-4-85 | MSMW-6-85 |
|-------------------------------|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | UG/L | 3RD QTR | 1ST QTR | 2ND QTR | 2ND QTR | 3RD QTR | 3RD-QTR | 1ST QTR |
| | | | | | DUPLICATE | | QC-REPEAT | |
| 1 PHENOL | .5 | ND | ND | 1.8 | 1.0 | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 5.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 40% | 71% | 90% | 80% | 32% | 18% | 60% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 55% | 70% | 78% | 46% | 40% | 30% | 40% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-85 2ND QTR | MSMW-6-85 3RD QTR | MSMW-6-85 3RD QTR DUPLICATE | MSMW-7-85 1ST QTR | MSMW-7-85 1ST QTR DUPLICATE | MSMW-7-85 2ND QTR | MSMW-7-85 3RD QTR |
|-------------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|
| 1 PHENOL | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 63% | 61% | 27% | 66% | 60% | 64% | 80% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 48% | 25% | 28% | 79% | 79% | 61% | 55% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-7-85 3RD QTR DUPLICATE | MSMW-1-86 1ST QTR | MSMW-1-86 2ND QTR | MSMW-1-86 3RD QTR | MSMW-3-86 1ST QTR | MSMW-4-86 1ST QTR | MSMW-4-86 1ST QTR QC-REPEAT |
|-------------------------------|----------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------|
| 1 PHENOL | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|-----|-----|
| 12 A.A.A-TRIFLUORO-M-CRESOL | 50 UG/L | 27% | 80% | 80% | 24% | 72% | 98% | 89% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 28% | 51% | 62% | 20% | 76% | 57% | 62% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

± = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-4-86 2ND QTR | MSMW-4-86 3RD QTR | MSMW-5-86 1ST QTR | MSMW-5-86 1ST QTR QC-REPEAT | MSMW-5-86 2ND QTR | MSMW-5-86 3RD QTR | MSMW-5-86 3RD QTR QC-REPEAT |
|-------------------------------|----------------|----------------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|
| 1 PHENOL | .5 | 1.1 | ND | ND | ND | 1.0 | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 60% | 42% | 80% | 65% | 73% | 53% | 58% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 57% | 14% | 79% | 79% | 69% | 41% | 34% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-6-86 1ST QTR | MSMW-6-86 2ND QTR | MSMW-6-86 3RD QTR | MSMW-7-86 1ST QTR | MSMW-7-86 2ND QTR | MSMW-7-86 3RD QTR | MSMW-8-86 1ST QTR |
|-------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1 PHENOL | .5 | ND | 1.1 | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|------|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 79% | 34% | 63% | 94% | 101% | 44% | 66% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 67% | 26% | 67% | 70% | 62% | 28% | 69% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-8-86 | MSMW-8-86 | MSMW-1-87 | MSMW-1-87 | MSMW-1-87 | MSMW-1-87 | MSMW-2-87 |
|-------------------------------|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | UG/L | 2ND QTR | 3RD QTR | 1ST QTR | 2ND QTR | 2ND QTR | 3RD QTR | 1ST QTR |
| | | QC-REPEAT | | | | | | |
| 1 PHENOL | .5 | 2.0 | ND | ND | 1.9 | 1.2 | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|------|-----|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 65% | 38% | 85% | 56% | 42% | 41% | 88% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 115% | 32% | 54% | 64% | 67% | 44% | 53% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-2-87 2ND QTR | MSMW-2-87 2ND QTR DUPLICATE | MSMW-2-87 3RD QTR | MSMW-2-87 3RD QTR DUPLICATE | MSMW-3-87 1ST QTR | MSMW-3-87 2ND QTR | MSMW-3-87 3RD QTR |
|-------------------------------|----------------|----------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|
| 1 PHENOL | .5 | 0.7 | ND | ND | ND | ND | 1.9 | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 58% | 61% | 47% | 41% | 92% | 69% | 40% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 58% | 47% | 21% | 26% | 72% | 66% | 37% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-4-87 | MSMW-4-87 | MSMW-4-87 | MSMW-4-87 | MSMW-5-87 | MSMW-5-87 | MSMW-5-87 |
|-------------------------------|----------------|-----------|-----------|-----------|----------------------|-----------|-----------|-----------|
| | | 1ST QTR | 2ND QTR | 3RD QTR | 3RD QTR QC-REPEAT | 1ST QTR | 2ND QTR | 3RD QTR |
| 1 PHENOL | .5 | ‡.2 | ND | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|----|------|-----|-----|-----|
| 12 A,A-A-TRIFLUORO-M-CRESOL | 50 UG/L | 50% | 18% | 9% | 107% | 74% | 56% | 52% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | 54% | 8% | 40% | 80% | 39% | 49% |

ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

& = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-6-87 | MSMW-6-87 | MSMW-6-87 | MSMW-6-87 | MSMW-7-87 | MSMW-7-87 | MSMW-7-87 |
|-------------------------------|--------|-----------|-----------|----------------------|-----------|-----------|-----------|-----------|
| | UG/L | 1ST QTR | 2ND QTR | 2ND QTR DUPLICATE | 3RD QTR | 1ST QTR | 2ND QTR | 3RD QTR |
| 1 PHENOL | .5 | 0.7 | ND | ND | ND | ND | 1.0 | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|-----|-----|
| 12 A,A-A-TRIFLUORO-M-CRESOL | 50 UG/L | 59% | 51% | 62% | 33% | 66% | 81% | 59% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | 48% | 68% | 29% | 75% | 88% | 36% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-8-87 1ST QTR | MSMW-8-87 2ND QTR | MSMW-8-87 2ND QTR QC-REPEAT | MSMW-8-87 3RD QTR | MSMW-9-87 1ST QTR | MSMW-9-87 1ST QTR DUPLICATE | MSMW-9-87 2ND QTR |
|--------------------------------|----------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|-----------------------------------|----------------------|
| 1 PHENOL | .5 | 0.5 | ND | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | | | | | | | | |
| | AMOUNT | | | | | | | |
| 12 A.A.A-TRIFLUORO-M-CRESOL | 50 UG/L | 58% | 54% | 68% | 106% | 108% | 62% | 61% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | 50% | 54% | 54% | 61% | 74% | 56% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-9-87 3RD QTR | MSMW-10-87 1ST QTR | MSMW-10-87 2ND QTR | MSMW-10-87 3RD QTR | MSMW-11-87 1ST QTR | MSMW-11-87 2ND QTR | MSMW-11-87 3RD QTR |
|-------------------------------|----------------|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 PHENOL | .5 | ND | ND | ND | ND | ND | 1.0 | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|------|-----|-----|
| 12 A.A.A-TRIFLUORO-M-CRESOL | 50 UG/L | 31% | 85% | 60% | 99% | 108% | 22% | 50% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 29% | 58% | 45% | 55% | 90% | 31% | 36% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED * = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-12-87 | MSMW-12-87 | MSMW-12-87 | MSMW-12-87 | MSMW-13-87 | MSMW-13-87 | MSMW-13-87 |
|-------------------------------|--------|------------|------------|------------|------------|------------|------------|------------|
| | UG/L | 1ST QTR | 2ND QTR | 3RD QTR | 3RD QTR | 1ST QTR | 1ST QTR | 2ND QTR |
| | | LOST SAMP | | | QC-REPEAT | | QC-REPEAT | |
| 1 PHENOL | .5 | | ND | ND | ND | ND | ND | 2.3 |
| 2 2-CHLOROPHENOL | 1.0 | | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | |
|-----------------------------|---------|----|-----|-----|------|-----|------|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | -- | 26% | 38% | 120% | 58% | 77% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | 37% | 29% | 77% | 45% | 128% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED & = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | MSMW-13-97 | MSMW-14-87 | MSMW-14-87 | MSMW-14-87 | MSMW-15-87 | MSMW-15-87 | MSMW-15-87 |
|-------------------------------|--------|------------|------------|------------|------------|------------|------------|------------|
| | UG/L | 3RD QTR | 1ST QTR | 2ND QTR | 3RD QTR | 1ST QTR | 2ND QTR | 4TH QTR |
| 1 PHENOL | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|------|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 39% | 131% | 45% | 56% | 88% | 77% | 44% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 33% | 118% | 56% | 39% | 67% | 46% | 42% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-15-87 | MSMW-15-87 |
|-------------------------------|----------------|----------------------|----------------------|
| | | 4TH QTR QC-REPEAT | 4TH QTR DUPLICATE |
| 1 PHENOL | .5 | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | |
|-----------------------------|---------|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 57% | 57% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 41% | 39% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 87-39-01 | 87-39-01 | P8-86 | P10-87-BLF | CITYW | CITYW | DIW |
|-------------------------------|----------------|------------------|----------------------|------------------|------------------|------------------|----------------------|------------------|
| | | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC-RPT | 1ST QTR QA/QC |
| 1 PHENOL | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|------|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 49% | 67% | 47% | 101% | 89% | 94% | 81% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | -- | -- | 68% | 74% | 86% | 59% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

: = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MSMW-16-87 | MSMW-16-87 | MSMW-16-87 | MSMW-16-87 |
|--------------------------------|----------------|------------------|------------------|----------------------|----------------------|
| | | 2ND QTR QA/QC | 3RD QTR QA/QC | 3RD QTR DUPLICATE | 3RD QTR DUPL(RPT) |
| 1 PHENOL | .5 | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | | | | | |
| | AMOUNT | | | | |
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 39% | 32% | 53% | <1% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 69% | 38% | 35% | 32% |

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SPIKED ACID EXTRACTABLES SAMPLES - PERCENT RECOVERY

| | COMPOUND | AMOUNT UG/L | REAGENT | REAGENT | REAGENT | REAGENT | REAGENT | REAGENT | REAGENT |
|--------------------------------|----------------------------|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | | BLANK#1 1ST QTR | BLANK#2 1ST QTR | BLANK#3 1ST QTR | BLANK#4 1ST QTR | BLANK#5 1ST QTR | BLANK#6 1ST QTR | BLANK#7 1ST QTR |
| 1 | PHENOL | 50.0 | 48 | 43 | 45 | 38 | 38 | 50 | 50 |
| 2 | 2-CHLOROPHENOL | 50.0 | 91 | 90 | 90 | 75 | 68 | 86 | 91 |
| 3 | 2-NITROPHENOL | 50.0 | 97 | 111 | 105 | 76 | 71 | 90 | 101 |
| 4 | 2,4-DIMETHYLPHENOL | 50.0 | 40 | 27 | 37 | 58 | 43 | 32 | 12 |
| 5 | 2,4-DICHLOROPHENOL | 50.0 | 92 | 66 | 151 | 79 | 70 | 88 | 98 |
| 6 | 4-CHLORO-3-METHYL PHENOL | 50.0 | 107 | 79 | 78 | 85 | 70 | 87 | 93 |
| 7 | 2,4,6-TRICHLOROPHENOL | 50.0 | 97 | 121 | 104 | 87 | 85 | 93 | 103 |
| 8 | 2,4-DINITROPHENOL | 50.0 | 97 | 74 | 55 | 84 | 90 | 77 | 97 |
| 9 | 4-NITROPHENOL | 50.0 | 1 | 15 | <1 | 28 | 45 | 48 | 53 |
| 10 | 2-METHYL-4,6-DINITROPHENOL | 50.0 | 132 | 112 | 105 | 103 | 100 | 86 | 106 |
| 11 | PENTACHLOROPHENOL | 50.0 | 116 | 134 | 128 | 70 | 105 | 83 | 104 |
| SURROGATE STANDARD RECOVERIES: | | | | | | | | | |
| | | AMOUNT | | | | | | | |
| 12 | A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 91 | 83 | 83 | 88 | 64 | 90 | 99 |
| 13 | 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | -- | -- | 68 | 95 | 82 | 81 |

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SPIKED ACID EXTRACTABLES SAMPLES - PERCENT RECOVERY

| COMPOUND | AMOUNT UG/L | MSMW-1-85 1ST QTR DUPLICATE | MSMW-4-85 1ST QTR | MSMW-10-87 1ST QTR | MSMW-11-87 1ST QTR | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR |
|--------------------------------|----------------|-----------------------------------|----------------------|-----------------------|-----------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 PHENOL | 50.0 | 38 | 27 | 46 | 36 | 35 | 32 | 45 |
| 2 2-CHLOROPHENOL | 50.0 | 67 | 54 | 98 | 70 | 57 | 72 | 86 |
| 3 2-NITROPHENOL | 50.0 | 70 | 64 | 98 | 70 | 59 | 72 | 92 |
| 4 2,4-DIMETHYLPHENOL | 50.0 | 26 | 3 | 51 | 48 | 29 | 41 | 50 |
| 5 2,4-DICHLOROPHENOL | 50.0 | 68 | 56 | 102 | 80 | 59 | 67 | 79 |
| 6 4-CHLORO-3-METHYL PHENOL | 50.0 | 73 | 44 | 102 | 82 | 70 | 72 | 79 |
| 7 2,4,6-TRICHLOROPHENOL | 50.0 | 88 | 70 | 115 | 90 | 82 | 76 | 91 |
| 8 2,4-DINITROPHENOL | 50.0 | 93 | 123 | 104 | 83 | 101 | 56 | 62 |
| 9 4-NITROPHENOL | 50.0 | 48 | 54 | 29 | 50 | 40 | 24 | 34 |
| 10 2-METHYL-4,6-DINITROPHENOL | 50.0 | 98 | 113 | 117 | 94 | 86 | 80 | 35 |
| 11 PENTACHLOROPHENOL | 50.0 | 108 | 107 | 90 | 127 | 96 | 63 | 73 |
| SURROGATE STANDARD RECOVERIES: | | | | | | | | |
| | AMOUNT | | | | | | | |
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 66 | 62 | 133 | 87 | 59 | 71 | 81 |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 97 | 74 | 99 | 101 | 83 | 65 | 85 |

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SPIKED ACID EXTRACTABLES SAMPLES - PERCENT RECOVERY

| COMPOUND | AMOUNT UG/L | REAGENT BLANK#4 2ND QTR | REAGENT BLANK#5 2ND QTR | MSMW-4-85 2ND QTR | MSMW-7-85 2ND QTR | MSMW-5-87 2ND QTR | MSMW-16-87 2ND QTR | REAGENT BLANK#1 3RD QTR |
|--------------------------------|----------------|-------------------------------|-------------------------------|----------------------|----------------------|----------------------|-----------------------|-------------------------------|
| 1 PHENOL | 50.0 | 46 | 26 | 50 | 31 | 49 | 42 | 29 |
| 2 2-CHLOROPHENOL | 50.0 | 78 | 50 | 75 | 56 | 51 | 63 | 45 |
| 3 2-NITROPHENOL | 50.0 | 75 | 57 | 74 | 53 | 65 | 67 | 50 |
| 4 2,4-DIMETHYLPHENOL | 50.0 | 47 | 15 | 31 | 6 | 6 | 11 | 33 |
| 5 2,4-DICHLOROPHENOL | 50.0 | 72 | 55 | 73 | 53 | 71 | 69 | 48 |
| 6 4-CHLORO-3-METHYL PHENOL | 50.0 | 84 | 59 | 81 | 52 | 75 | 72 | 54 |
| 7 2,4,6-TRICHLOROPHENOL | 50.0 | 88 | 66 | 85 | 61 | 92 | 82 | 53 |
| 8 2,4-DINITROPHENOL | 50.0 | 94 | 58 | 91 | 87 | 140 | 72 | 59 |
| 9 4-NITROPHENOL | 50.0 | 48 | 16 | 39 | 45 | 73 | 38 | 28 |
| 10 2-METHYL-4,6-DINITROPHENOL | 50.0 | 98 | 72 | 108 | 89 | 136 | 79 | 60 |
| 11 PENTACHLOROPHENOL | 50.0 | 90 | 63 | 93 | 95 | 163 | 77 | 45 |
| SURROGATE STANDARD RECOVERIES: | | | | | | | | |
| | AMOUNT | | | | | | | |
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 77 | | 77 | 52 | 42 | 69 | 56 |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 88 | 78 | 104 | 81 | 70 | 67 | 56 |

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SPIKED ACID EXTRACTABLES SAMPLES - PERCENT RECOVERY

| COMPOUND | AMOUNT UG/L | REAGENT BLANK#2 3RD QTR | MSMW-3-85 3RD QTR | MSMW-1-86 3RD QTR | MSMW-9-87 3RD QTR | REAGENT BLANK#1 4TH QTR |
|--------------------------------|-------------------|-------------------------------|----------------------|----------------------|----------------------|-------------------------------|
| 1 PHENOL | 50.0 | 25 | 41 | 38 | 58 | 32 |
| 2 2-CHLOROPHENOL | 50.0 | 51 | 68 | 71 | 90 | 56 |
| 3 2-NITROPHENOL | 50.0 | 47 | 68 | 68 | 86 | 65 |
| 4 2,4-DIMETHYLPHENOL | 50.0 | 11 | 22 | 25 | 7 | 23 |
| 5 2,4-DICHLOROPHENOL | 50.0 | 48 | 65 | 66 | 76 | 70 |
| 6 4-CHLORO-3-METHYL PHENOL | 50.0 | 47 | 84 | 66 | 74 | 110 |
| 7 2,4,6-TRICHLOROPHENOL | 50.0 | 51 | 80 | 66 | 74 | 92 |
| 8 2,4-DINITROPHENOL | 50.0 | 42 | 136 | 37 | 71 | 94 |
| 9 4-NITROPHENOL | 50.0 | 21 | 65 | 26 | 34 | 47 |
| 10 2-METHYL-4,6-DINITROPHENOL | 50.0 | 65 | 128 | 57 | 91 | 92 |
| 11 PENTACHLOROPHENOL | 50.0 | 65 | 102 | 49 | 77 | 116 |
| SURROGATE STANDARD RECOVERIES: | | | | | | |
| 12 A,A,A-TRIFLUORO-M-CRESOL | AMOUNT 50 UG/L | 37 | 46 | 83 | 37 | 50 |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 51 | 61 | 67 | 33 | 70 |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

X = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | FIELD BLANK#1 1ST QTR | FIELD BLANK#2 1ST QTR | FIELD BLANK#3 1ST QTR | FIELD BLANK#1 2ND QTR | FIELD BLANK#1 3RD QTR | FIELD BLANK#2 3RD QTR | FIELD BLANK#1 4TH QTR |
|-------------------------------|----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| 1 PHENOL | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 47% | 58% | 68% | 25% | 48% | <1% | 62% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | 73% | 69% | 62% | 37% | 25% | 60% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR | REAGENT BLANK#4 1ST QTR | REAGENT BLANK#5 1ST QTR | REAGENT BLANK#6 1ST QTR | REAGENT BLANK#7 1ST QTR |
|-------------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 PHENOL | .5 | ND | ND | ND | ND | ND | ND | 43.2 |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | 1.9 |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|------|------|-----|-----|------|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 97% | 58% | 103% | 104% | 57% | 72% | 105% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | -- | 64% | 67% | 79% | 64% | 66% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

8 = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#1 2ND QTR | REAGENT BLANK#2 2ND QTR | REAGENT BLANK#3 2ND QTR | REAGENT BLANK#4 2ND QTR | REAGENT BLANK#5 2ND QTR | REAGENT BLANK#6 2ND QTR | REAGENT BLANK#1 3RD QTR |
|-------------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 PHENOL | .5 | ND | 6.5 | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|-----|------|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 49% | 63% | 56% | 69% | 71% | -- | 122% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 65% | 56% | 65% | 54% | 78% | 59% | 56% |

ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#2 3RD QTR | REAGENT BLANK#3 3RD QTR | REAGENT BLANK#4 3RD QTR | REAGENT BLANK#5 3RD QTR | REAGENT BLANK#1 4TH QTR | REAGENT BLANK#2 4TH QTR |
|-------------------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 PHENOL | .5 | ND | ND | ND | ND | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 90% | 47% | 39% | 36% | 86% | 32% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 11% | 40% | 34% | 33% | 49% | 34% |

APPENDIX G6

Fresh Water Aquifer
Organochlorine Compounds

Analyses by:

Barringer-Magenta Ltd.
Rexdale, Ontario

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. | MSMW-1-85 | MSMW-1-85 | MSMW-1-85 | MSMW-1-85 | MSMW-1-85 | MSMW-3-85 | MSMW-3-85 |
|---------------------|--------|-----------|----------------------|----------------------|-----------|-----------|-----------|-----------|
| | UG/L | 1ST QTR | 1ST QTR QC REPEAT | 1ST QTR DUPLICATE | 2ND QTR | 3RD QTR | 2ND QTR | 3RD QTR |
| 1 HEXACHLOROBENZENE | .0010 | 0.0010 | 1.0010 | 1.0010 | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCS'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. US/L | MSMW-4-85 | MSMW-4-85 | MSMW-4-84 | MSMW-4-85 | MSMW-6-85 | MSMW-6-85 | MSMW-6-85 |
|---------------------|----------------|-----------|-----------|----------------------|-----------|-----------|-----------|-----------|
| | | 1ST QTR | 2ND QTR | 2ND QTR DUPLICATE | 3RD QTR | 1ST QTR | 2ND QTR | 3RD QTR |
| 1 HEXACHLOROBENZENE | .0010 | 0.0020 | ND | ND | ND | *.0040 | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-6-85 3RD QTR DUPLICATE | MSMW-7-85 1ST QTR | MSMW-7-85 1ST QTR QC REPEAT | MSMW-7-85 1ST QTR DUPLICATE | MSMW-7-85 2ND QTR | MSMW-7-85 3RD QTR | MSMW-7-85 3RD QTR | MSMW-7-85 3RD QTR |
|---------------------|----------------|-----------------------------------|----------------------|-----------------------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND | *.0015 | *.0015 | 0.0017 | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-7-85 3RD QTR DUPLICATE | MSMW-1-86 1ST QTR | MSMW-1-86 1ST QTR QC-REPEAT | MSMW-1-86 2ND QTR | MSMW-1-86 3RD QTR | MSMW-3-86 1ST QTR | MSMW-4-86 1ST QTR |
|---------------------|----------------|-----------------------------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND | 0.0040 | 0.0046 | ND | ND | \$.0010 | 0.0047 |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-4-86 2ND QTR | MSMW-4-86 3RD QTR | MSMW-5-86 1ST QTR | MSMW-5-86 2ND QTR | MSMW-5-86 3RD QTR | MSMW-6-86 1ST QTR | MSMW-6-86 2ND QTR |
|---------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | *.0016 | ND | ND | 0.0030 | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-6-86 | MSMW-7-86 | MSMW-7-86 | MSMW-7-86 | MSMW-7-86 | MSMW-8-86 | MSMW-8-86 |
|---------------------|----------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| | | 3RD QTR | 1ST QTR | 2ND QTR | 3RD QTR | 3RD QTR | 1ST QTR | 2ND QTR |
| | | | | | | QC-REPEAT | | |
| 1 HEXACHLOROBENZENE | .0010 | ND | 0.0054 | ND | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-8-86 3RD QTR | MSMW-8-86 3RD QTR QC-REPEAT | MSMW-1-87 1ST QTR | MSMW-1-87 2ND QTR | MSMW-1-87 3RD QTR | MSMW-2-87 1ST QTR |
|---------------------|----------------|----------------------|-----------------------------------|----------------------|----------------------|----------------------|----------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | 0.0061 | ND | ND | 0.0040 |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-2-87 | MSMW-2-87 | MSMW-2-87 | MSMW-2-87 | MSMW-2-87 | MSMW-3-87 | MSMW-3-87 |
|---------------------|----------------|----------------------|----------------------|----------------------|-----------|----------------------|-----------|-----------|
| | | 2ND QTR QC-REPEAT | 2ND QTR DUPLICATE | 2ND QTR DUPL(RPT) | 3RD QTR | 3RD QTR DUPLICATE | 1ST QTR | 2ND QTR |
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | *.0015 | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

= AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-3-87 3RD QTR | MSMW-4-87 1ST QTR | MSMW-4-87 2ND QTR | MSMW-4-87 3RD QTR | MSMW-5-87 1ST QTR | MSMW-5-87 2ND QTR LOST SAMP | MSMW-5-87 3RD QTR |
|---------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------------------|----------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-6-87 | MSMW-6-87 | MSMW-6-87 | MSMW-6-87 | MSMW-7-87 | MSMW-7-87 | MSMW-7-87 |
|---------------------|----------------|-----------|-----------|----------------------|-----------|-----------|-----------|-----------|
| | | 1ST QTR | 2ND QTR | 2ND QTR DUPLICATE | 3RD QTR | 1ST QTR | 2ND QTR | 3RD QTR |
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

= AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-8-87 1ST QTR | MSMW-8-87 2ND QTR | MSMW-8- 3RD QTR | MSMW-9-87 1ST QTR | MSMW-9-87 2ND QTR | MSMW-9-87 3RD QTR | MSMW-10-87 1ST QTR |
|---------------------|----------------|----------------------|----------------------|--------------------|----------------------|----------------------|----------------------|-----------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND | 0.0015 | ND | 1.0012 | ND | ND | 0.0043 |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | 0.0013 | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-10-87 | MSMW-10-87 | MSMW-11-87 | MSMW-11-87 | MSMW-11-87 | MSMW-11-87 | MSMW-12-87 |
|---------------------|----------------|------------|------------|------------|------------|------------|------------|------------|
| | | 2ND QTR | 3RD QTR | 1ST QTR | 2ND QTR | 3RD QTR | 3RD QTR | 1ST QTR |
| | | | | | | | QC-REPEAT | |
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | ND | 0.0022 |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-12-87 | MSMW-12-87 | MSMW-12-87 | MSMW-13-87 | MSMW-13-87 | MSMW-13-87 | MSMW-14-87 |
|---------------------|----------------|------------|------------|------------|------------|------------|------------|------------|
| | | 2ND QTR | 2ND QTR | 3RD QTR | 1ST QTR | 2ND QTR | 3RD QTR | 1ST QTR |
| | | QC-REPEAT | | | | | | |
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

1 = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-14-87 | MSMW-14-87 | MSMW-14-87 | MSMW-14-87 | MSMW-14-87 | MSMW-15-87 | MSMW-15-87 |
|---------------------|----------------|----------------------|------------|----------------------|------------|----------------------|------------|------------|
| | | 1ST QTR QC-REPEAT | 2ND QTR | 2ND QTR QC-REPEAT | 3RD QTR | 3RD QTR QC-REPEAT | 1ST QTR | 2ND QTR |
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | 0.0040 | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-15-87 | MSMW-15-87 | MSMW-15-87 |
|---------------------|----------------|------------|------------|------------|
| | | 4TH QTR | 4TH QTR | 4TH QTR |
| | | DUPLICATE | QC-REPEAT | |
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | 87-39-01 | P8-86 | P10-87-9LF | CITYM | DIW | MSMW-16-87 | MSMW-16-87 |
|---------------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC | 1ST QTR QA/QC | 2ND QTR QA/QC | 3RD QTR QA/QC |
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

: = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | MSMW-16-27 3RD QTR QA/QC DUPL |
|---------------------|----------------|-------------------------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND |
| 2 HEPTACHLOR | .0005 | ND |
| 3 ALDRIN | .0005 | 1.0005 |
| 4 OCTACHLOROSTYRENE | .0010 | ND |
| 5 PP'-DDE | .0005 | ND |
| 6 MIREX | .0010 | ND |
| 7 TOTAL PCB'S | .0100 | ND |

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SPIKED ORGANOCHLORINE SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR | REAGENT BLANK#4 1ST QTR | REAGENT BLANK#5 1ST QTR | REAGENT BLANK#6 1ST QTR | REAGENT BLANK#7 1ST QTR |
|---------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 HEXACHLOROBENZENE | 0.0250 | 79 | 108 | | 98 | 82 | | 100 |
| 2 HEPTACHLOR | 0.0250 | 89 | 94 | | 101 | 90 | | 97 |
| 3 ALDRIN | 0.0250 | 97 | 90 | | 100 | 83 | | 89 |
| 4 OCTACHLOROSTYRENE | 0.0250 | 85 | 93 | | 104 | 91 | | 94 |
| 5 PP'-DDE | 0.0250 | 88 | 99 | | 107 | 91 | | 86 |
| 6 MIREX | 0.0700 | 92 | 106 | | 106 | 77 | | 80 |
| 7 TOTAL PCB'S | 0.2500 | | | 99 | | | 112 | |

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SPIKED ORGANOCHLORINE SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | 87-39-01 | MSMW-2-87 | MSMW-5-87 | MSMW-7-87 | MSMW-9-87 | REAGENT | REAGENT |
|---------------------|----------------|----------|-----------|-----------|-----------|-----------|--------------------|--------------------|
| | | 1ST QTR | 1ST QTR | 1ST QTR | 1ST QTR | 1ST QTR | BLANK#1 2ND QTR | BLANK#2 2ND QTR |
| 1 HEXACHLOROBENZENE | 0.0250 | 87 | 99 | 98 | | 85 | 86 | 79 |
| 2 HEPTACHLOR | 0.0250 | 88 | 116 | 92 | | 89 | 77 | 83 |
| 3 ALDRIN | 0.0250 | 90 | 107 | 95 | | 81 | 93 | 78 |
| 4 OCTACHLOROSTYRENE | 0.0250 | 90 | 110 | 95 | | 87 | 92 | 81 |
| 5 PP'-DDE | 0.0250 | 89 | 110 | 90 | | 82 | 91 | 80 |
| 6 MIREX | 0.0700 | 91 | 125 | 89 | | 87 | 88 | 83 |
| 7 TOTAL PCB'S | 0.2500 | | | | 107 | | | |

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SPIKED ORGANOCHLORINE SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | REAGENT BLANK#3 2ND QTR | REAGENT BLANK#4 2ND QTR | REAGENT BLANK#5 2ND QTR | SAMP. 4 MSMW-4-85 DUPLICATE | MSMW-4-87 2ND QTR | MSMW-11-87 2ND QTR | MSMW-15-87 2ND QTR |
|---------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------------|----------------------|-----------------------|-----------------------|
| 1 HEXACHLOROBENZENE | 0.0250 | 122 | | 72 | | 67 | 87 | 81 |
| 2 HEPTACHLOR | 0.0250 | 97 | | 70 | | 71 | 67 | 88 |
| 3 ALDRIN | 0.0250 | 109 | | 75 | | 67 | 94 | 97 |
| 4 OCTACHLOROSTYRENE | 0.0250 | 125 | | 75 | | 69 | 101 | 117 |
| 5 PP'-DDE | 0.0250 | 121 | | 70 | | 68 | 78 | 97 |
| 6 MIREX | 0.0700 | 113 | | 75 | | 67 | 109 | 107 |
| 7 TOTAL PCB'S | 0.2500 | | 90 | | 102 | | | |

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SPIKED ORGANOCHLORINE SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | REAGENT BLANK#1 3RD QTR | REAGENT BLANK#2 3RD QTR | REAGENT BLANK#3 3RD QTR | REAGENT BLANK#4 3RD QTR | REAGENT BLANK#5 3RD QTR | REAGENT BLANK#6 3RD QTR | MSM JAV DUPLI |
|---------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|---------------------|
| 1 HEXACHLOROBENZENE | 0.0250 | | 65 | 52 | 63 | | 70 | |
| 2 HEPTACHLOR | 0.0250 | | 67 | 57 | 71 | | 72 | |
| 3 ALDRIN | 0.0250 | | 60 | 53 | 60 | | 63 | |
| 4 OCTACHLOROSTYRENE | 0.0250 | | 63 | 58 | 62 | | 67 | |
| 5 PP'-DDE | 0.0250 | | 85 | 77 | 78 | | 92 | |
| 6 MIREX | 0.0700 | | 87 | 78 | 79 | | 88 | |
| 7 TOTAL PCB'S | 0.2500 | 97 | | | | | | |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | FIELD | FIELD | FIELD | FIELD | FIELD | FIELD | FIELD |
|---------------------|----------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | | BLANK#1 1ST QTR | BLANK#2 1ST QTR | BLANK#3 1ST QTR | BLANK#4 1ST QTR | BLANK#1 2ND QTR | BLANK#1 3RD QTR | BLANK#2 3RD QTR |
| 1 HEXACHLOROBENZENE | .0010 | ND | 0.0050 | ND | *.0017 | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | FIELD BLANK#1 4TH QTR |
|---------------------|----------------|-----------------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND |
| 2 HEPTACHLOR | .0005 | ND |
| 3 ALDRIN | .0005 | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND |
| 5 PP'-DDE | .0005 | ND |
| 6 MIREX | .0010 | ND |
| 7 TOTAL PCB'S | .0100 | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#1 1ST QTR | REAGENT BLANK#2 1ST QTR | REAGENT BLANK#3 1ST QTR | REAGENT BLANK#4 1ST QTR | REAGENT BLANK#5 1ST QTR | REAGENT BLANK#6 1ST QTR | REAGENT BLANK#7 1ST QTR |
|---------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | 0.0050 | 0.0018 | *.0015 |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#8 1ST QTR | REAGENT BLANK#9 1ST QTR | REAGENT BLANK#1 2ND QTR | REAGENT BLANK#2 2ND QTR | REAGENT BLANK#3 2ND QTR | REAGENT BLANK#4 2ND QTR | REAGENT BLANK#1 3RD QTR |
|---------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 HEXACHLOROBENZENE | .0010 | 0.0042 | 0.0017 | 0.0017 | ND | ND | ND | 0.0017 |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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SPIKED ORGANOCHLORINE SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | MSMW-6-86 3RD QTR | MSMW-6-87 3RD QTR | MSMW-13-87 3RD QTR | REAGENT BLANK#1 4TH QTR | REAGENT BLANK#2 4TH QTR |
|---------------------|----------------|----------------------|----------------------|-----------------------|-------------------------------|-------------------------------|
| 1 HEXACHLOROBENZENE | 0.0250 | | 80 | 94 | 78 | |
| 2 HEPTACHLOR | 0.0250 | | 89 | 110 | 99 | |
| 3 ALDRIN | 0.0250 | | 71 | 89 | 100 | |
| 4 OCTACHLOROSTYRENE | 0.0250 | | 74 | 95 | 101 | |
| 5 PP'-DDE | 0.0250 | | 92 | 120 | 110 | |
| 6 MIREX | 0.0700 | | 91 | 123 | 109 | |
| 7 TOTAL PCB'S | 0.2500 | 64 | | | | 97 |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

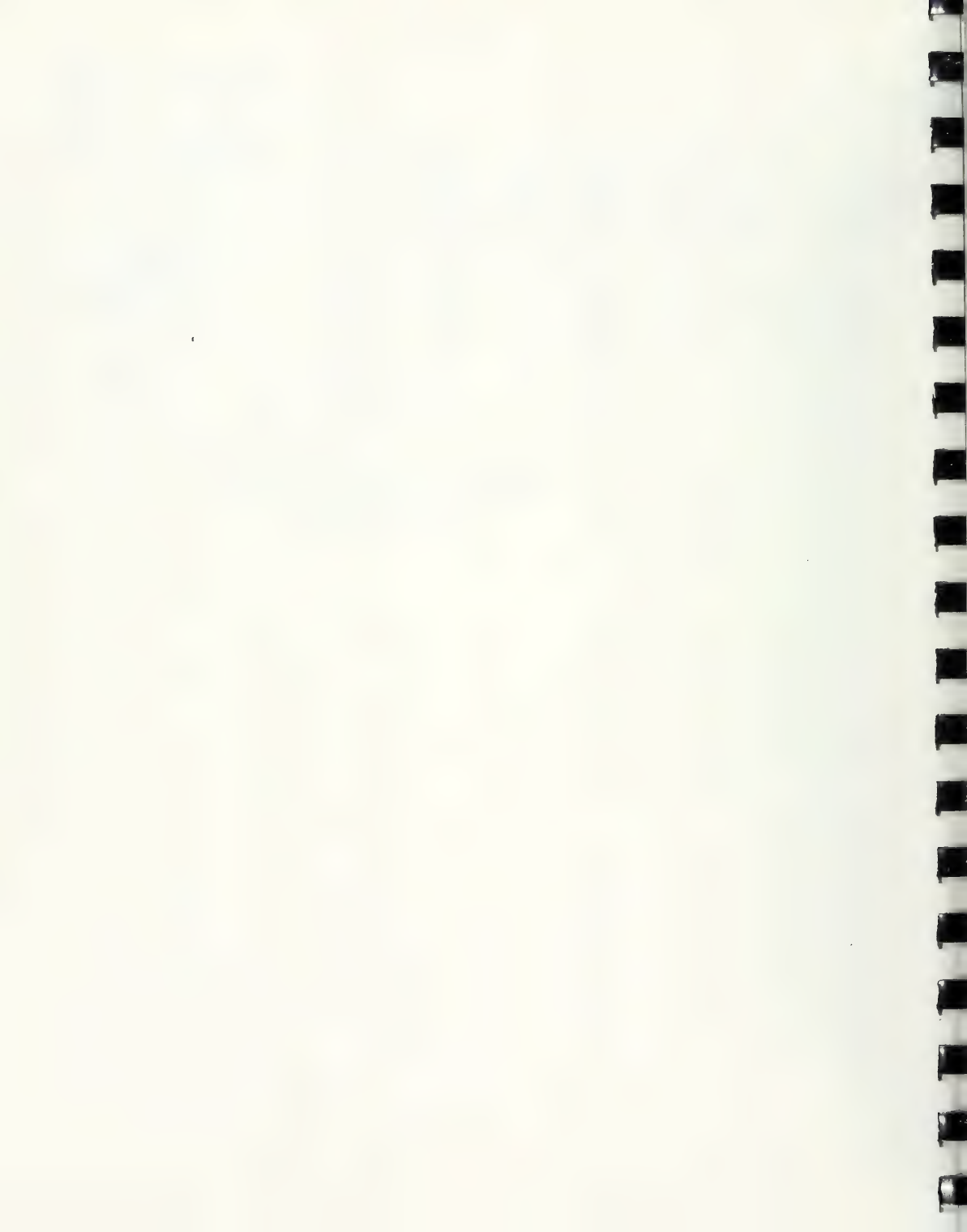
* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | REAGENT BLANK#1 3RD QTR | REAGENT BLANK#2 3RD QTR | REAGENT BLANK#3 3RD QTR | REAGENT BLANK#4 3RD QTR | REAGENT BLANK#5 3RD QTR | REAGENT BLANK#1 4TH QTR | REAGENT BLANK#1 4TH QTR |
|---------------------|----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| 1 HEXACHLOROBENZENE | .0010 | 0.0017 | ND | ND | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

APPENDIX H

"Westbay" Casing Installation Log
and Casing Completion Summary

Borehole MDMW-1



MP System Casing Installation Log

Project: SARNIA (INTERA FOR MOE, INTERA No. H87-039) WB Ref: WB 538-87
 Location: SARNIA, ONTARIO Hole No: MDMW-1 Installed by: R.S./A.S.
 Hole Depth: 303 m MP Depth: 300 m Hole Diameter: HQ (4 1/2") Date Installed: OCT. 22, 23, 24, 25 1987
 Measurement Datum: GROUND SURFACE Datum Elevation: _____ Date Drawn: _____

| Depth (m) | Geological Description | Geologic Log | MP Casing Log | DEPTH (m) (Serial No./ Batch No.) | Final Packer Pressure/Volume | Comments | Joint Tests Joint Pass |
|--------------|------------------------|--------------|---------------|---|---------------------------------|---|------------------------------|
| 0 | | | 137 | | | STEEL CASING STICK-UP = 0.4 m | 137 ✓ |
| 3 | | | 136 | 1.4 | | STICK-UP OF CUT MP ABOVE G.S. = 0.9 m | 136 ✓ |
| 6 | | | 135 | 2.9 | | (0.675 m CUT OFF) DISTANCE FROM TOP OF CUT MP TO CENTER OF NEXT COUPLING = 0.81 m | 135 ✓ |
| 9 | | | 134 | 5.9 | | | 134 ✓ |
| 12 | | | 133 | 8.9 | | NOTE: JOINT TEST CONSTITUTES HYDRAULIC PRESSURE OF ~100 PSI BEING APPLIED TO JOINT FOR 1 MIN. MINIMUM. | 133 ✓ |
| 15 | | | 132 | 11.9 | | | 132 ✓ |
| 18 | | | 131 | 14.9 (87-122) | | | 131 ✓ |
| 21 | | | 130 | 16.4 (87-122) | | | 130 ✓ |
| 24 | | | 129 | 17.9 | | | 129 ✓ |
| 27 | | | 128 | 20.9 | | | 128 ✓ |
| 30 | | | 127 | 23.9 | | | 127 ✓ |
| | | | 126 | 26.9 (3056) | | | 126 ✓ |
| | | | 125 | 29.9 | | | 125 ✓ |

OVERBURDEN

Regular
MP Casing

MP Packer

Settlement
CasingMeasurement
Port CouplingPumping
Port CouplingRegular
Coupling

MP System Casing Installation Log

Project: SARNIA (INTERA FOR MOE, INTERA No. H87-039) WB Ref: WB 538-87
 Location: SARNIA, ONTARIO Hole No: MDM W - 1 Installed by: R.S./A.S.
 Hole Depth: 303 m MP Depth: 300 m Hole Diameter: HQ (4 1/2") Date Installed: Oct. 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 1987
 Measurement Datum: GROUND SURFACE Datum Elevation: _____ Date Drawn: _____

| Depth (m) | Geological Description | Geologic Log | MP Casing Log | DEPTH (m) (Serial No.) (Batch No.) | Final Packer Pressure/Volume | Comments | Joint Tests joint pass |
|-----------|------------------------|--------------|---------------|------------------------------------|------------------------------|-------------------------------------|------------------------|
| 30 | | | 125 | | | | 125 |
| 33 | | | 124 | 32.9 | | | 124 ✓ |
| 36 | | | 123 | 35.9 (87-122) | | | 123 ✓ |
| 39 | | | 122 | 37.4 (87-122) | | | 122 ✓ |
| 42 | | | 121 | 38.9 | | HW (4" I.D.) STEEL CASING TO 42.8 m | 121 ✓ |
| 45 | | | 120 | 41.9 (3066) | | | 120 ✓ |
| 48 | | | 119 | 44.9 (87-122) | | | 119 ✓ |
| 51 | | | 118 | 46.4 (87-122) | | | 118 ✓ |
| 54 | | | 117 | 47.9 (87-122) | | | 117 ✓ |
| 57 | | | 116 | 49.4 | | | 116 ✓ |
| 60 | | | 115 | 52.4 (3067) | | | 115 ✓ |
| | | | 114 | 55.4 (87-122) | | | 114 ✓ |
| | | | 113 | 56.9 (87-122) | | | 113 ✓ |
| | | | 112 | 58.4 | | | 112 ✓ |

KETTLE POINT SHALE



Regular MP Casing



MP Packer



Settlement Casing



Measurement Port Coupling



Pumping Port Coupling



Regular Coupling

Project: SARNIA (INTERA FOR MDE, INTERA No. 487-039) WB Ref: WB 538-B7
 Location: SARNIA, ONTARIO Hole No: MDMW-1 Installed by: R.S./A.S.
 Hole Depth: 303m MP Depth: 300m Hole Diameter: 40 (4 1/2") Date Installed: Oct. 22, 23, 24, 25
 Measurement Datum: GROUND SURFACE Datum Elevation: _____ Date Drawn: 1987

 Measurement Port Coupling
  Pumping Port Coupling
  Regular Coupling

Project: SARNIA (INTERA FOR MDE, INTERA No. H87-039)WB Ref: WB 538Location: SARNIA, ONTARIOHole No: MDMW-1Installed by: R.S./AHole Depth: 303 mMP Depth: 300 mHole Diameter: HQ (4 1/2")Date Installed: Oct 22, 2001Measurement Datum: GROUND SURFACE

Datum Elevation: _____

Date Drawn: _____

| Depth (m) | Geological Description | Geologic Log | MP Casing Log | Depth (m) Serial No. (Batch No.) | Final Packer Pressure/Volume | Comments | Job To |
|-----------|------------------------|--------------|---------------|----------------------------------|------------------------------|----------|--------|
| 90 | | | 96 | 91.4 (3083) | | | 96 |
| 93 | | | 95 | 94.4 | | | 95 |
| 96 | | | 94 | 97.4 (87-122) | | | 96 |
| 99 | | | 93 | 98.9 (87-122) | | | 97 |
| 102 | | | 92 | 100.4 | | | 98 |
| 105 | | | 91 | 103.4 (3087) | | | 99 |
| 108 | | | 90 | 106.4 (87-122) | | | 100 |
| 111 | | | 89 | 107.9 (87-122) | | | 101 |
| 114 | | | 88 | 109.4 | | | 102 |
| 117 | | | 87 | 110.9 (5090) | | | 103 |
| 120 | | | 86 | 113.9 (87-122) | | | 104 |
| | | | 85 | 115.4 (87-122) | | | 105 |
| | | | 84 | 116.9 | | | 106 |
| | | | 83 | 119.9 | | | 107 |
| | | | | MAGNETIC LOCATION COLLAR | | | 108 |
| | | | | | | | 109 |
| | | | | | | | 110 |
| | | | | | | | 111 |
| | | | | | | | 112 |
| | | | | | | | 113 |
| | | | | | | | 114 |
| | | | | | | | 115 |
| | | | | | | | 116 |
| | | | | | | | 117 |
| | | | | | | | 118 |
| | | | | | | | 119 |
| | | | | | | | 120 |

Regular
MP Casing

MP Packer

Settlement
CasingMeasurement
Port CouplingPumping
Port CouplingRegular
Coupling

MP System Casing Installation Log

Project: SARNIA (INTERA FOR MOE, INTERA No. H87-039) WB Ref: WB 538-87
 Location: SARNIA, ONTARIO Hole No: MDMW-1 Installed by: R.S./A.S.
 Hole Depth: 303m MP Depth: 300m Hole Diameter: 40 (4 1/2") Date Installed: Oct. 23, 23, 24, 2.
 Measurement Datum: GROUND SURFACE Datum Elevation: _____ Date Drawn: 1987

| Depth (M) | Geological Description | Geologic Log | MP Casing Log | DEPTH (m) (Serial No./Batch No.) | Final Packer Pressure/Volume | Comments | Joint Tests Joint Pass |
|-----------|-----------------------------------|------------------------------|---------------|----------------------------------|------------------------------|-------------|------------------------|
| 120 | | | 83 | 165.4 119.9 | | ▲ | 83 ✓ |
| 123 | | | 82 | 122.9 (2907) | | | 82 ✓ |
| 126 | GAS ZONE, $P_i = 190 \text{ psi}$ | | 81 | 125.9 (87-122) | | REINFORCING | 81 ✓ |
| 129 | | HAMILTON SHALE | 80 | 127.4 (87-122) | | STAINLESS | 80 ✓ |
| 132 | | | 79 | 128.9 | | STEEL | 79 ✓ |
| 135 | | | 78 | 131.9 (3085) | | | 78 ✓ |
| 138 | | | 77 | 134.9 (87-122) | | CLAMPS | 77 ✓ |
| 141 | | | 76 | 136.4 (87-122) | | ADDED | 76 ✓ |
| 144 | MUD SEAM | | 75 | 137.4 | | TO | 75 ✓ |
| 147 | | DUNDEE OIL BEARING LIMESTONE | 74 | 140.9 (3129) | | STAINLESS | 74 ✓ |
| 150 | | | 73 | 143.9 (87-122) | | | 73 ✓ |
| | | | 72 | 145.4 (87-122) | | | 72 ✓ |
| | | | 71 | 146.9 (87-122) | | ▲ | 71 ✓ |
| | | | 70 | 148.4 | | | 70 ✓ |



MP System
Casing Installation Log

Project: SARNIA (INTERA FOR MOE, INTERA No. H87-039) WB Ref: WB 538-87
 Location: SARNIA, ONTARIO Hole No: MDMW-1 Installed by: R.S./A.S.
 Hole Depth: 303 M MP Depth: 300 M Hole Diameter: HQ (4 1/2") Date Installed: OCT. 23-25/87
 Measurement Datum: GROUND SURFACE Datum Elevation: _____ Date Drawn: _____

| Depth (M) | Geological Description | Geologic Log | MP Casing Log | DEPTH (m) Serial No. Batch No. | Final Packer Pressure/Volume | Comments | Joint Tests Joint pass |
|-----------|------------------------|--------------------------|---------------|--------------------------------|------------------------------|----------------------------------|------------------------|
| 150 | ↑ | | 69 | 151.4 | | | 69 ✓ |
| 153 | | | 68 | 152.9 (102) | | STAINLESS STEEL MEASUREMENT PORT | 68 ✓ |
| | | | 67 | 154.4 | | | 67 ✓ |
| 156 | MUD SEAMS | | 66 | 155.9 (87-122) | | | 66 ✓ |
| | | | 65 | 157.4 (87-122) | | | 65 ✓ |
| 159 | OIL BEARING | | 64 | 158.9 | | | 64 ✓ |
| | | | 63 | 161.9 (3120) | | | 63 ✓ |
| 162 | POROUS CORAL | | 62 | 164.9 (87-122) | | | 62 ✓ |
| 165 | MUD SEAM | | 61 | 166.4 (87-122) | | | 61 ✓ |
| 168 | | LIMESTONE | 60 | 167.9 | | | 60 ✓ |
| | | | 59 | 170.9 (1659) | | MAGNETIC LOCATION COLLAR | 59 ✓ |
| 171 | MUD SEAM | | 58 | 173.9 (3119) | | | 58 ✓ |
| 174 | | DUNDEE MASSIVE LIMESTONE | 57 | 176.9 (87-122) | | | 57 ✓ |
| 177 | | | 56 | 178.4 (3118) | | | 56 ✓ |
| 180 | | | 55 | 179.9 | | | 55 ✓ |



Regular MP Casing



MP Packer



Settlement Casing



Measurement Port Coupling



Pumping Port Coupling



Regular Coupling

MP System Casing Installation Log

Project: SARNIA (INTERA FOR MDG, INTERA No. HBT-039) WB Ref: WB 538-B7
 Location: SARNIA, ONTARIO Hole No: MDMW-1 Installed by: R.S./A.S.
 Hole Depth: 303 m MP Depth: 300 m Hole Diameter: 40(4 1/2") Date Installed: OCT. 23-25/12
 Measurement Datum: GROUND SURFACE Datum Elevation: _____ Date Drawn: _____

| Depth (m) | Geological Description | Geologic Log | MP Casing Log | DEPTH (m) / Serial No. / Batch No. | Final Packer Pressure/Volume | Comments | Joint Tests | Joint Pass |
|-----------|------------------------------------|------------------|---------------|------------------------------------|---|----------|-------------|------------|
| 180 | | DUNDEE LIMESTONE | 55 | (3118) 179.9 | | | 55 | ✓ |
| 183 | | | 54 | 182.9 | | | 54 | ✓ |
| | | | 53 | (87-122) 184.4 | | | 53 | ✓ |
| 186 | | | 52 | (87-126) (3117) 185.9 | | | 52 | ✓ |
| 189 | | | 51 | 188.9 | | | 51 | ✓ |
| | POROUS DOLOMITE SULPHUROUS ODOR | LUCAS DOLOMITE | 50 | 190.4 (463) | MAGNETIC LOCATION COLLAR STAINLESS STEEL PUMPING BRT | | 50 | ✓ |
| 192 | | | 49 | 191.4 (104) | STAINLESS STEEL MEASUREMENT PORT | | 49 | ✓ |
| | | | 48 | 193.4 | | | 48 | ✓ |
| 195 | | | 47 | 196.4 (87-122) | | | 47 | ✓ |
| 198 | ANHYDRITE SEAMS | | 46 | 197.9 (87-122) | | | 46 | ✓ |
| | | LUCAS DOLOMITE | 45 | 199.4 (87-122) | | | 45 | ✓ |
| 201 | | | 44 | (3115) 200.9 | | | 44 | ✓ |
| 204 | | | 43 | 203.9 | | | 43 | ✓ |
| | | | 42 | (464) 205.4 | MAGNETIC LOCATION COLLAR STAINLESS STEEL PUMPING BRT | | 42 | ✓ |
| 207 | BITUMEN / SULPHUR INFUSING | | 41 | (103) 206.9 | STAINLESS STEEL MEASUREMENT PORT | | 41 | ✓ |
| 210 | | | 40 | 208.4 | | | 40 | ✓ |

Regular
MP Casing

MP Packer

Settlement
CasingMeasurement
Port CouplingPumping
Port CouplingRegular
Coupling

397

MP System
Casing Installation Log

Project: SARNIA (INTERA FOR MOE, INTERA NO. H87-C89) WB Ref: WB 53B-87
 Location: SARNIA, ONTARIO Hole No: MDMW-2 Installed by: R.S./A.S.
 Hole Depth: 303 m MP Depth: 300 m Hole Diameter: 4 1/2" Date Installed: Oct. 23-25/87
 Measurement Datum: GROUND SURFACE Datum Elevation: _____ Date Drawn: _____

| Depth (m) | Geological Description | Geologic Log | MP Casing Log | DEPTH (m) / Serial No. / Batch No. | Final Packer Pressure/Volume | Comments | Joint Tests | Joint Pass |
|-----------|------------------------|--------------|---------------|------------------------------------|------------------------------|---|-------------|------------|
| 210 | | | | | | | | |
| | | | 39 | 211.4 | | | 39 | ✓ |
| | | | 38 | (87-122) | | | 38 | ✓ |
| 213 | | | | 212.9 | | | | |
| | | | 37 | (87-122) | | | 37 | ✓ |
| | | | | 214.4 | | | | |
| | | | 36 | (87-122) | | | 36 | ✓ |
| 216 | | | | 215.9 | | | | |
| | | | | | | | | |
| 219 | | | 35 | (3116) | | | 35 | ✓ |
| | | | | 218.9 | | | | |
| | | | | | | | | |
| 222 | | | 34 | 221.9 | | | 34 | ✓ |
| | | | | (87-122) | | | | |
| | | | 33 | 223.4 | | | 33 | ✓ |
| 225 | | | | (87-122) | | | 32 | ✓ |
| | | | 32 | 224.9 | | | | |
| | | | | | | | | |
| 228 | | | 31 | (3113) | | | 31 | ✓ |
| | | | | 227.9 | | | | |
| | | | | | | | | |
| 231 | | | 30 | 230.9 | | LEAKS AT FIRST, REPLACED COUPLING - THEN O.K. | 30 | ✓ |
| | | | | (87-122) | | | 29 | ✓ |
| | | | 29 | 232.4 | | | | |
| 234 | | | | (87-122) | | | 28 | ✓ |
| | | | 28 | 233.9 | | | | |
| | | | | | | | | |
| 237 | | | 27 | 236.9 | | MAGNETIC LOCATION COLLAR | 27 | ✓ |
| | | | | (1660) | | | | |
| | | | | | | | | |
| 240 | | | 26 | (3114) | | | 26 | ✓ |
| | | | | 237.9 | | | | |

Regular
MP Casing

MP Packer

Settlement
CasingMeasurement
Port CouplingPumping
Port CouplingRegular
Coupling

MP System Casing Installation Log

Project: SARNIA (INTERA FOR MOE, INTERA No. H37-039) WB Ref: W8538-87
 Location: SARNIA, ONTARIO Hole No: MDMW-1 Installed by: R.S./A.S.
 Hole Depth: 303 m MP Depth: 300 m Hole Diameter: 48/4 1/2" Date Installed: Oct 23-25/87
 Measurement Datum: GROUND SURFACE Datum Elevation: _____ Date Drawn: _____

| Depth (M) | Geological Description | Geologic Log | MP Casing Log | Depth, m / Serial No. / Batch No. | Final Packer Pressure/Volume | Comments | Joint Tests joint pass |
|-----------|------------------------|------------------|---------------|-----------------------------------|------------------------------|--|------------------------|
| 240 | | GYPSUM ANHYDRITE | 26 | (3114) 239.9 | | | 22 ✓ |
| 243 | | | 25 | 242.9 (87-122) | | | 25 ✓ |
| | | | 24 | 244.4 (87-122) | | | 24 ✓ |
| 246 | OIL IN CORE | | 23 | 245.9 | | | 23 ✓ |
| 249 | ANHYDRITE | | 22 | 248.9 (3112) | | | 22 ✓ |
| 252 | | | 21 | 251.9 (87-122) | | | 21 ✓ |
| | | | 20 | 253.4 (87-122) | | | 20 ✓ |
| 255 | | | 19 | 254.9 | | | 19 ✓ |
| 258 | | | 18 | 257.9 (3111) | | | 18 ✓ |
| 261 | | | 17 | 260.9 (87-122) | | | 17 ✓ |
| | | | 16 | 262.4 (87-122) | | | 16 ✓ |
| 264 | OIL STAINED | | 15 | 263.9 (87-122) | | | 15 ✓ |
| 267 | VERTICAL FRACTURES | | 14 | 265.4 | | | 14 ✓ |
| 270 | | | 13 | 268.4 (653) | | MAGNETIC LOCATION COLLAR 26" ABOVE CENTER OF COUPLING. | 13 ✓ |



MP System Casing Installation Log

Project: SARNIA (INTERA FOR MOE, INTERA NO. H37-039) WB Ref: WB538-87
 Location: SARNIA, ONTARIO Hole No: MDMW-1 Installed by: R.S./A.S.
 Hole Depth: 303m MP Depth: 300m Hole Diameter: HQ(4 1/2") Date Installed: Oct. 23-25/87
 Measurement Datum: GROUND SURFACE Datum Elevation: _____ Date Drawn: _____

| Depth (m) | Geological Description | Geologic Log | MP Casing Log | Serial No. / Batch No. | Final Packer Pressure/Volume | Comments | Joint Tests joint pass |
|-----------|------------------------|----------------------------------|---------------|------------------------|------------------------------|---|------------------------|
| 270 | | SHALE | | | | | 12 ✓ |
| 273 | VERTICAL FRACTURES | | 12 | (3088) 271.4 | | | 11 ✓ |
| 276 | | LUCAS DOLOMITE | 11 | 274.4 (87-122) | | | 10 ✓ |
| 279 | | | 10 | 275.9 (87-122) | | | 9 ✓ |
| 282 | | | 9 | 277.4 | | | 8 ✓ |
| 285 | OIL VERT. FRACTURES | | 8 | (3089) 280.4 | | | 7 ✓ |
| 288 | | AMHERSTBURG DOLOMITE - LIMESTONE | 7 | 283.4 | | | 6 ✓ |
| 291 | | | 6 | 286.4 (87-122) | | | 5 ✓ |
| 294 | | | 5 | 287.9 (87-122) | | | 4 ✓ |
| 297 | FOSSIL AND SEAMS | | 4 | 289.4 (87-122) | | | 3 ✓ |
| 300 | | | 3 | (3128) 290.9 | | | 2 ✓ |
| | | | 2 | (1658) 293.9 | | MAGNETIC LOCATION COLLAR 26" ABOVE CENTER OF COUPLING | 1 ✓ |
| | | | 1 | (3082) 296.9 | | | |
| | | | | | | BOTTOM OF HOLE = 303 m | |



Regular MP Casing



MP Packer



Settlement Casing



Measurement Port Coupling



Pumping Port Coupling



Regular Coupling

CASING COMPLETION SUMMARY

Page 1 of 2

Site Location: SARINIA, ONTARIO

INTERA For Moe, INTERA No. H87-039

Installation Date: Oct. 23-25, 1987

Drillhole No.: MDMW-1

Technician(s): R.S./A.S.

Weather/Temperature: _____

Job No./Client: WB 538-87/INTERA, MOE

| Completion Zone | DEPTH Interval M | Length M | Piezometer | | Pumping Port | | Volume Pumped | Apparent "I" | Comments (Geology, etc.) |
|-----------------|---------------------|-------------|------------|------------|--------------|------------|---------------|--------------|---|
| | | | # | Depth M | # | Depth M | | | |
| 1 | 290.6-303.0 | 12.4 | 1 | 296.9 | 2 | 293.9 | | | -DEPTH FROM GROUND SURFACE |
| 2 | 277.1-286.7 | 9.6 | 3 | 290.9 | | | | | -ALL PILING PORT LOCATIONS HAVE |
| 3 | 265.1-274.7 | 9.6 | 8 | 280.4 | | | | | A MAGNETIC LOCATION COLLAR |
| 4 | 254.6-261.2 | 6.6 | 12 | 271.4 | 13 | 268.4 | | | INSTALLED ~26" ABOVE PT |
| 5 | 245.6-252.2 | 6.6 | 18 | 257.9 | | | | | -ALL PORTS PLASTIC UNLESS NOTED OTHERWISE |
| 6 | 233.6-243.2 | 9.6 | 22 | 248.9 | | | | | |
| 7 | 224.6-231.2 | 6.6 | 26 | 239.9 | 27 | 236.9 | | | |
| 8 | 215.6-222.2 | 6.6 | 31 | 227.9 | | | | | |
| 9 | 206.6-211.7 | 11.1 | 35 | 218.9 | | | | | |
| | | | 41 | 206.9 | 42 | 205.4 | | | BOTH PORTS STAINLESS STEEL |
| | | | 44 | 200.9 | | | | | |
| 10 | 185.6-196.7 | 11.1 | 49 | 191.4 | 50 | 190.4 | | | BOTH PORTS STAINLESS STEEL |
| | | | 52 | 185.9 | | | | | |
| 11 | 179.6-183.2 | 3.6 | 55 | 179.9 | | | | | |
| 12 | 167.6-177.2 | 9.6 | 58 | 173.9 | 59 | 170.9 | | | |
| 13 | 158.6-165.2 | 6.6 | 63 | 161.9 | | | | | |
| 14 | 148.1-156.2 | 8.1 | 68 | 152.9 | | | | | STAINLESS STEEL |
| 15 | 138.1-144.2 | 7.1 | 74 | 140.9 | | | | | ALL JOINTS RE-INFORCED WITH STAINLESS |
| 16 | 128.6-135.2 | 6.6 | 78 | 131.9 | | | | | STEEL CLAMPS |

Site Location: SARNIA, ONTARIO (INTERA FOR MOE, INTERA NO. H07-039)

MDMW-1

Installation Date: OCT. 23-25, 1987

Technician(s): R.S./A.S.

Job No./Client: 48538-87/INTERA, MOE

[illegible]

APPENDIX I

Hydraulic Test Results
Borehole MDMW-1

APPENDIX II

Summary of Analyses and Results
Hydraulic Testing
Borehole MDMW-1

HYDRAULIC TEST ANALYSES - DEEP BOREHOLE

i) Constant Pressure Injection/Withdrawal Tests

The measured flow rates and injection/withdrawal heads of the drill stem tests, straddle packer injection tests, and casing withdrawal tests were expressed as hydraulic conductivity assuming steady radial confined flow using the relation (Hvorslev, 1951):

$$K = \frac{Q}{\Delta H 2 \pi L} \ln (r_b / r_w) \quad (1)$$

where: Q = steady volumetric flow rate (L^3/T);
 ΔH = steady injection/withdrawal head (L);
 L = test interval length (L);
 r_b = radius to constant pressure boundary assumed equal to 10 m
 r_w = radius of borehole equal to 0.048 m.

Table II-1 summarizes the test data and calculated hydraulic conductivities from the drill stem tests. Several results are expressed as less than some value because no measurable flow was recorded during the tests.

Table II-2 summarizes the test data and calculated hydraulic conductivities from the straddle packer injection tests.

The test data and calculated hydraulic conductivities of the casing withdrawal tests are given in Table II-3. In this table several results are expressed as greater than a specified value due to uncertainty in withdrawal head measurement due to frictional head losses through the measurement port and sampler probe.

ii) Pulse Tests

Straddle packer pulse tests including packer pulse tests both in the test interval and below the probe and piston pulse tests were analyzed using the type curve method of Bredehoeft and Papadopoulos (1980).

The type curve analytical method involves plotting in normalized form, the decay of a pressure pulse against log time and the fitting of the normalized decay curve to a type curve characterized by an α value to obtain curve model parameters of t and β . The hydraulic conductivity is determined from the match point values and the properties of the fluid and characteristics of the test interval using (Bredehoeft and Papadopoulos, 1980):

$$K = \frac{\beta V C \rho g}{\pi t L} \quad (2)$$

where: K = hydraulic conductivity (L/T);
 β = dimensionless curve match parameter;
 V = test interval fluid volume (L³);
 C = test interval compressibility (LT²/M);
 ρ = fluid density (M/L³);
 g = gravitational acceleration (L/T²);
 t = curve match parameter (T);
 L = test interval length (L).

The test interval compressibility is a measure of changing volume, changing pressure characteristics of the test interval and includes the total system compressibility due to the compressibility of the test interval fluid and of compliant test equipment, such as inflatable packers, flexible tubing and "O" ring seals. The compressibility is defined as:

$$C = \frac{\Delta V}{V \Delta P} \quad (3)$$

where: C = test interval compressibility (LT^2/M);
 ΔV = change in fluid volume (L^3);
 ΔP = change in fluid pressure ($M/L \cdot T^2$).

The storage coefficient (storativity) of the formation can also be approximately determined from the type curve method using the α value of the type curve and characteristics of the test interval using:

$$S = \frac{\alpha V C \phi g}{\pi r_w^2} \quad (4)$$

where: α = dimensionless type curve parameter;
 S = dimensionless storage coefficient for tested interval;
 r_w = radius of wellbore equal to 0.048 m.

Estimates of storativity determined using equation (4) are, at best, only order of magnitude accurate.

Piston pulse tests were analyzed using equation (2) with fresh water fluid properties and an interval compressibility C determined from the measured displacement volume of the piston (3 mL), observed pressure pulse magnitude and calculated test interval volume. The test data of these tests and the calculated hydraulic conductivities and storativities are given in Table II-4. Plots of normalized pulse decay and best visually fit type curves of these tests are given in Appendix I2. During several of these tests instantaneous decay of the pulse occurred or no pulse was measured and only an estimate of hydraulic conductivity as being greater than 1×10^{-8} m/s can be reported.

Packer pulse tests were analyzed using a compressibility C of 2×10^{-9} Pa⁻¹ m/s. This value is slightly more compressible than ordinary water at 10°C and was determined from comparison of packer pulse tests to piston pulse and injection tests performed on the same interval (i.e., Tests MD138

and 146 performed at 288.10-293.32 m depth, Tests MD124 at 218.10-223.32 m depth, etc.). The test data and calculated hydraulic conductivities of the P2 packer pulse tests are given in Table I1-5. The plots and type curve analyses of these tests are given in Appendix I3. In several of these tests a very rapid decay of the inflation pulse was measured and hydraulic conductivities can only be reported as greater than 1×10^{-9} m/s. The test data and calculated hydraulic conductivities of the below probe and (P1) packer pulse tests are given in Table I1-6. The plots and type curve analyses of these tests are given in Appendix I4. Because of packer creep the decay of the pulse in the packer pulse test is artificially prolonged and the estimated hydraulic is considered a minimum value.

TABLE I1-1

SUMMARY OF DRILL STEM TEST RESULTS
BOREHOLE MDMW-1 SARNIA, ONTARIO

| TEST # | INTERVAL TOP (mBGS) | INTERVAL BOT (mBGS) | INTERVAL LENGTH (m) | FLOWRATE Q (m ³ /sec) | INJ. HEAD dH (m) | Q/dH (m ² /sec) | HYDRAULIC COND. (m/sec) |
|--------|---------------------------|---------------------------|---------------------------|--|------------------------|-------------------------------|-------------------------------|
| DST-1 | 50.60 | 59.20 | 8.60 < | 4.2E-07 | 21.0 < | 2.0E-08 < | 2.0E-09 |
| DST-2 | 81.10 | 89.60 | 8.50 < | 3.1E-07 | 19.7 < | 1.6E-08 < | 1.6E-09 |
| DST-3 | 102.40 | 110.90 | 8.50 < | 4.2E-07 | 17.6 < | 2.4E-08 < | 2.4E-09 |
| DST-4* | 120.70 | 135.40 | 14.70 | 4.3E-06 | 64.0 | 6.7E-08 | 3.9E-09 |
| DST-5 | 143.24 | 165.91 | 22.67 < | 6.5E-08 | 30.0 < | 2.2E-09 < | 8.1E-11 |
| DST-6 | 181.06 | 196.30 | 15.24 | 1.1E-05 | 40.0 | 2.8E-07 | 1.5E-08 |
| DST-7 | 202.40 | 226.80 | 24.40 | 2.5E-05 | 40.8 | 6.1E-07 | 2.1E-08 |
| DST-8 | 229.80 | 254.20 | 24.40 | 2.7E-06 | 5.4 | 5.0E-07 | 1.7E-08 |
| DST-9 | 247.50 | 260.30 | 12.80 | GEOCHEMICAL SAMPLING | | | |
| DST-10 | 270.40 | 284.00 | 13.60 | 3.1E-05 | 40.2 | 7.7E-07 | 4.8E-08 |

* WITHDRAWAL TEST

TABLE I1-3

SUMMARY OF "WESTBAY" CASING WITHDRAWAL TEST RESULTS
BOREHOLE MDMW-1 SARNIA, ONTARIO

| TEST # | INTERVAL TOP (mBGS) | INTERVAL BOT (mBGS) | INTERVAL LENGTH (m) | FLOWRATE Q (m3/sec) | WITHDRAWAL HEAD (m) | Q/dH (m2/sec) | HYDRAULIC COND. (m/sec) |
|--------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|------------------|-------------------------------|
| WCT-1 | 58.20 | 66.10 | 7.90 | 7.0E-08 | 36.0 | 1.9E-09 | 2.1E-10 |
| WCT-2 | 70.20 | 79.60 | 9.40 | 2.3E-06 < | 14.8 > | 1.6E-07 > | 1.4E-08 |
| WCT-3 | 167.70 | 177.10 | 9.40 | 9.5E-08 | 13.4 | 7.1E-09 | 6.4E-10 |
| WCT-4 | 233.70 | 243.10 | 9.40 | 7.0E-07 | 18.8 | 3.7E-08 | 3.4E-09 |
| WCT-5 | 265.20 | 274.60 | 9.40 | 3.2E-06 < | 10.2 > | 3.1E-07 > | 2.8E-08 |
| WCT-6 | 290.70 | 303.00 | 12.30 | 6.9E-08 | 12.7 | 5.4E-09 | 3.8E-10 |

TABLE I1-4

SUMMARY OF STRADDLE PACKER TEST RESULTS PISTON PULSE RESPONSE (P2)
BOREHOLE MDMW-1 SARNIA, ONTARIO

| TEST NUMBER | INTERVAL TOP (mBGS) | INTERVAL BOT (mBGS) | INTERVAL LENGTH (m) | PULSE MAG (mv) | PULSE MAG (m) | CURVE | | MATCH | | HYDRAULIC CONDUCT (m/s) | STORATIVITY | COMMENTS |
|----------------|---------------------------|---------------------------|---------------------------|----------------------|---------------------|---------|--------------------------|-------|------------|-------------------------------|-------------|-----------------|
| | | | | | | ALPHA | t for beta=1 (min) | | | | | |
| MD105 | 148.10 | 153.32 | 5.22 | 4.29 | 8.38 | 1.0E-01 | 70.00 | | | 5.20E-12 | 1.55E-05 | |
| 6 | 153.10 | 158.32 | 5.22 | 3.85 | 7.52 | 1.0E-02 | 21.00 | | | 1.93E-11 | 1.72E-06 | |
| 7 | 158.10 | 163.32 | 5.22 | 3.56 | 6.96 | 1.0E-01 | 380.00 | | | 1.15E-12 | 1.86E-05 | |
| 8 | 163.10 | 168.32 | 5.22 | 3.04 | 5.94 | 1.0E-03 | 12.00 | | | 4.28E-11 | 2.18E-07 | |
| 9 | 168.10 | 173.32 | 5.22 | 0.59 | 1.15 | 1.0E-01 | 205.00 | | | 1.29E-11 | 1.12E-04 | |
| 10 | 173.10 | 178.32 | 5.22 | 1.64 | 3.20 | 1.0E-02 | 1.20 | | | 7.93E-10 | 4.04E-06 | |
| 11 | 178.10 | 183.32 | 5.22 | 1.13 | 2.21 | 1.0E-02 | 1.40 | | | 9.86E-10 | 5.87E-06 | |
| 12 | 183.10 | 188.32 | 5.22 | 0.00 | 0.00 | | | | | NA | NA | PISTON STICKING |
| 13 | 188.10 | 193.32 | 5.22 | 0.00 | 0.00 | | | | | NA | NA | PISTON STICKING |
| 14 | 193.10 | 198.32 | 5.22 | 0.00 | 0.00 | | | | | NA | NA | PISTON STICKING |
| 15 | 178.10 | 183.32 | 5.22 | 0.00 | 0.00 | | | | | NA | NA | PISTON STICKING |
| 16 | 178.10 | 183.32 | 5.22 | 2.64 | 5.16 | 1.0E-02 | 0.90 | | | 6.57E-10 | 2.51E-06 | |
| 17 | 183.10 | 188.32 | 5.22 | 0.84 | 1.64 | NM | NM | > | 1.00E-08 * | NA | INST.DECAY | |
| 18 | 188.10 | 193.32 | 5.22 | 0.22 | 0.43 | NM | NM | > | 1.00E-08 * | NA | INST.DECAY | |
| 19 | 193.10 | 198.32 | 5.22 | 0.00 | 0.00 | | | > | 1.00E-08 * | NA | NO PULSE | |
| 20 | 198.10 | 203.32 | 5.22 | 0.33 | 0.64 | NM | NM | > | 1.00E-08 * | NA | INST.DECAY | |
| 21 | 203.10 | 208.32 | 5.22 | 0.00 | 0.00 | | | > | 1.00E-08 * | NA | NO PULSE | |
| 22 | 208.10 | 213.32 | 5.22 | 0.74 | 1.45 | NM | NM | > | 1.00E-08 * | NA | INST.DECAY | |
| 23 | 213.10 | 218.32 | 5.22 | 0.09 | 0.18 | NM | NM | > | 2.00E-09 * | NA | MIN. PULSE | |
| 24 | 218.10 | 223.32 | 5.22 | 2.83 | 5.53 | 1.0E-02 | 0.30 | | | 1.84E-09 | 2.34E-06 | |
| 25 | 223.10 | 228.32 | 5.22 | 2.79 | 5.45 | 1.0E-02 | 0.33 | | | 1.69E-09 | 2.38E-06 | |
| 26 | 228.10 | 233.32 | 5.22 | 0.16 | 0.31 | NM | NM | > | 1.00E-08 * | NA | INST.DECAY | |
| 27 | 233.10 | 238.32 | 5.22 | 1.08 | 2.11 | 5.0E-01 | 0.13 | | | 1.11E-08 | 3.07E-04 | |
| 28 | 238.10 | 243.32 | 5.22 | 3.05 | 5.96 | 1.0E-01 | 0.42 | | | 1.22E-09 | 2.17E-05 | |
| 37 | 283.10 | 288.32 | 5.22 | 1.98 | 3.87 | 1.0E-01 | 1.00 | | | 7.88E-10 | 3.35E-05 | |
| 38 | 288.10 | 293.32 | 5.22 | 2.33 | 4.55 | 1.0E-01 | 0.71 | | | 9.43E-10 | 2.85E-05 | |
| 39 | 293.10 | 298.32 | 5.22 | 2.88 | 5.63 | 1.0E-02 | 6.00 | | | 9.03E-11 | 2.30E-06 | |

NM - NO MATCH

NA - NOT APPLICABLE

* - ESTIMATE BASED ON STRIP CHART RESPONSE

TABLE I1-5

SUMMARY OF STRADDLE PACKER TEST RESULTS PACKER PULSE RESPONSE (P2)
BOREHOLE MDMW-1 SARNIA, ONTARIO

| TEST NUMBER | INTERVAL | | | PULSE | | CURVE ALPHA | MATCH t for beta=1 (min) | HYDRAULIC CONDUCT (m/s) | STORATIVITY | COMMENTS |
|----------------|---------------|---------------|---------------|-------------|------------|----------------|-----------------------------------|-------------------------------|-------------|------------|
| | TOP (mBGS) | BOT (mBGS) | LENGTH (m) | MAG (mv) | MAG (m) | | | | | |
| MD122 | 208.10 | 213.32 | 5.22 | 19.45 | 38.01 | NM | NM > | 1.00E-09 | | MIN. PULSE |
| 23 | 213.10 | 218.32 | 5.22 | 7.70 | 15.05 | NM | NM > | 1.00E-09 | | MIN. PULSE |
| 24 | 218.10 | 223.32 | 5.22 | 32.66 | 63.82 | 1.0E-03 | 0.50 > | 1.38E-09 > | 9.37E-08 | |
| 25 | 223.10 | 228.32 | 5.22 | 32.64 | 63.78 | 1.0E-02 | 1.80 > | 3.83E-10 > | 9.37E-07 | |
| 26 | 228.10 | 233.32 | 5.22 | 7.91 | 15.46 | NM | NM > | 1.00E-09 | | MIN. PULSE |
| 27 | 233.10 | 238.32 | 5.22 | 15.75 | 30.78 | 1.0E-01 | 0.31 > | 2.22E-09 > | 9.37E-06 | |
| 28 | 238.10 | 243.32 | 5.22 | 30.78 | 60.15 | 1.0E-03 | 0.95 > | 7.25E-10 > | 9.37E-08 | |
| 29 | 243.10 | 248.32 | 5.22 | 12.98 | 25.36 | 1.0E-02 | 2.00 > | 3.45E-10 > | 9.37E-07 | |
| 30 | 248.10 | 253.32 | 5.22 | 20.91 | 40.86 | 1.0E-02 | 0.70 > | 9.85E-10 > | 9.37E-07 | |
| 31 | 253.10 | 258.32 | 5.22 | 12.94 | 25.29 | NM | NM > | 1.00E-09 | | MIN. PULSE |
| 32 | 258.10 | 263.32 | 5.22 | 14.38 | 28.10 | NM | NM > | 1.00E-09 | | MIN. PULSE |
| 33 | 263.10 | 268.32 | 5.22 | 8.30 | 16.22 | NM | NM > | 1.00E-09 | | MIN. PULSE |
| 34 | 268.10 | 273.32 | 5.22 | 4.09 | 7.99 | NM | NM > | 1.00E-09 | | MIN. PULSE |
| 35 | 273.10 | 278.32 | 5.22 | 3.53 | 6.90 | NM | NM > | 1.00E-09 | | MIN. PULSE |
| 36 | 278.10 | 283.32 | 5.22 | 26.77 | 52.31 | 1.0E-03 | 0.40 > | 1.72E-09 > | 9.37E-08 | |
| 37 | 283.10 | 288.32 | 5.22 | 31.32 | 61.20 | 1.0E-03 | 1.30 > | 5.30E-10 > | 9.37E-08 | |
| 38 | 288.10 | 293.32 | 5.22 | 29.70 | 58.04 | 1.0E-02 | 2.00 > | 3.45E-10 > | 9.37E-07 | |
| 39 | 293.10 | 298.32 | 5.22 | 26.70 | 52.17 | 1.0E-02 | 6.30 > | 1.09E-10 > | 9.37E-07 | |

NM - NO MATCH

NA - NOT APPLICABLE

TABLE I1-6

SUMMARY OF STRADDLE PACKER TEST RESULTS BELOW PROBE PULSE RESPONSE (P1)
 BOREHOLE MDMW-1 SARNIA, ONTARIO

| TEST NUMBER | INTERVAL TOP (mBGS) | INTERVAL BOT (mBGS) | INTERVAL LENGTH (m) | PULSE | | CURVE ALPHA | MATCH t for beta=1 (min) | HYDRAULIC CONDUCT (m/s) | STORATIVITY |
|----------------|---------------------------|---------------------------|---------------------------|-------------|------------|----------------|-----------------------------------|-------------------------------|-------------|
| | | | | MAG (mv) | MAG (m) | | | | |
| MD134 | 273.95 | 303.56 | 29.61 | 2.11 | 4.12 | NM | NM | NA | NA |
| 35 | 278.95 | 303.56 | 24.61 | 5.01 | 9.79 | 1.0E-02 | 0.85 > | 8.11E-10 | 4.42E-06 |
| 36 | 283.95 | 303.56 | 19.61 | 7.35 | 14.36 | 1.0E-02 | 0.42 > | 1.64E-09 | 3.52E-06 |
| 37 | 288.95 | 303.56 | 14.61 | 13.66 | 26.69 | 1.0E-02 | 0.67 > | 1.03E-09 | 2.62E-06 |
| 38 | 293.95 | 303.56 | 9.61 | 21.59 | 42.19 | 1.0E-01 | 2.80 > | 2.46E-10 | 1.73E-05 |
| 39 | 298.95 | 303.56 | 4.61 | 27.81 | 54.34 | 1.0E-01 | 12.00 > | 5.75E-11 | 8.28E-06 |

NM - NO MATCH

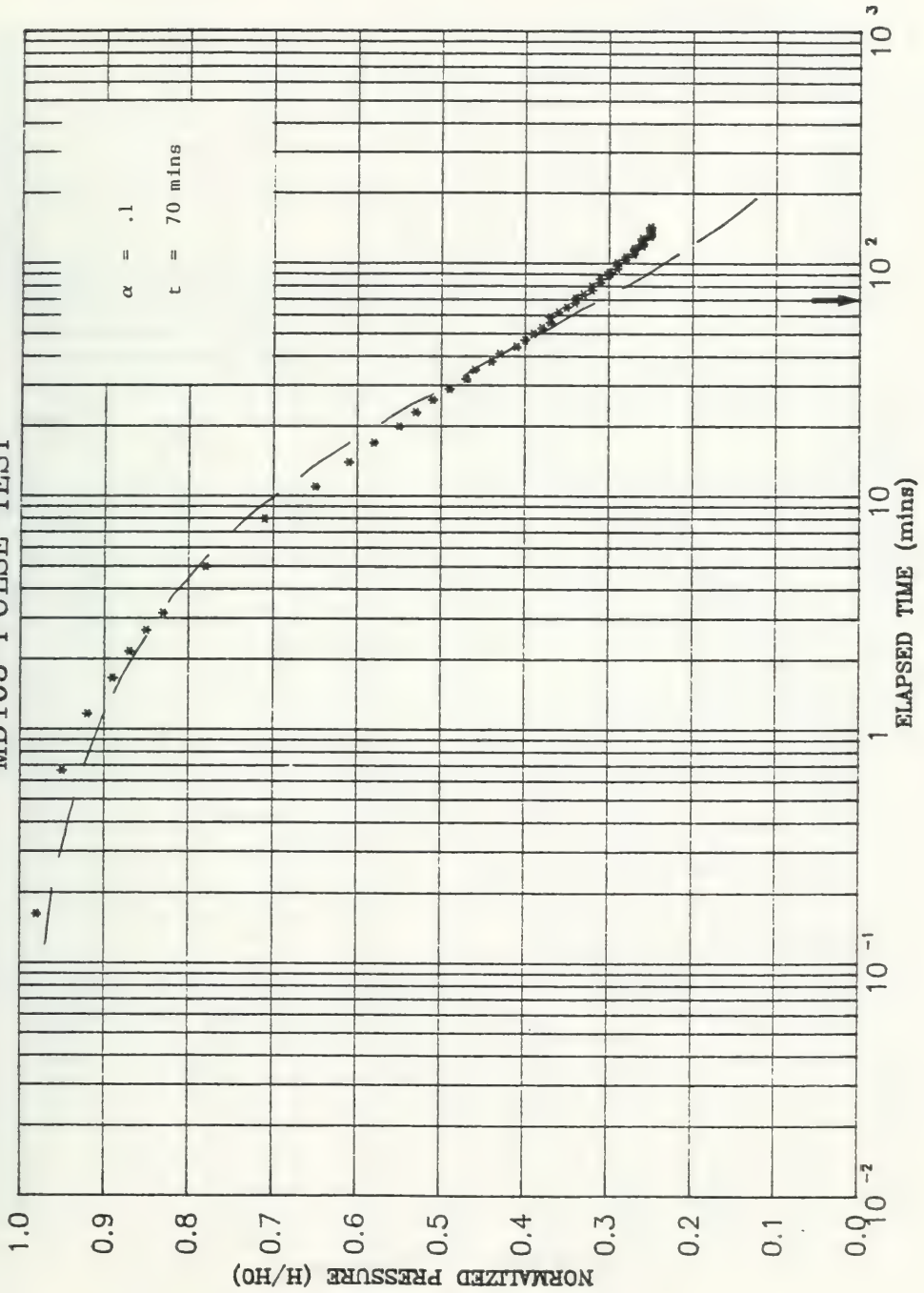
NA - NOT APPLICABLE

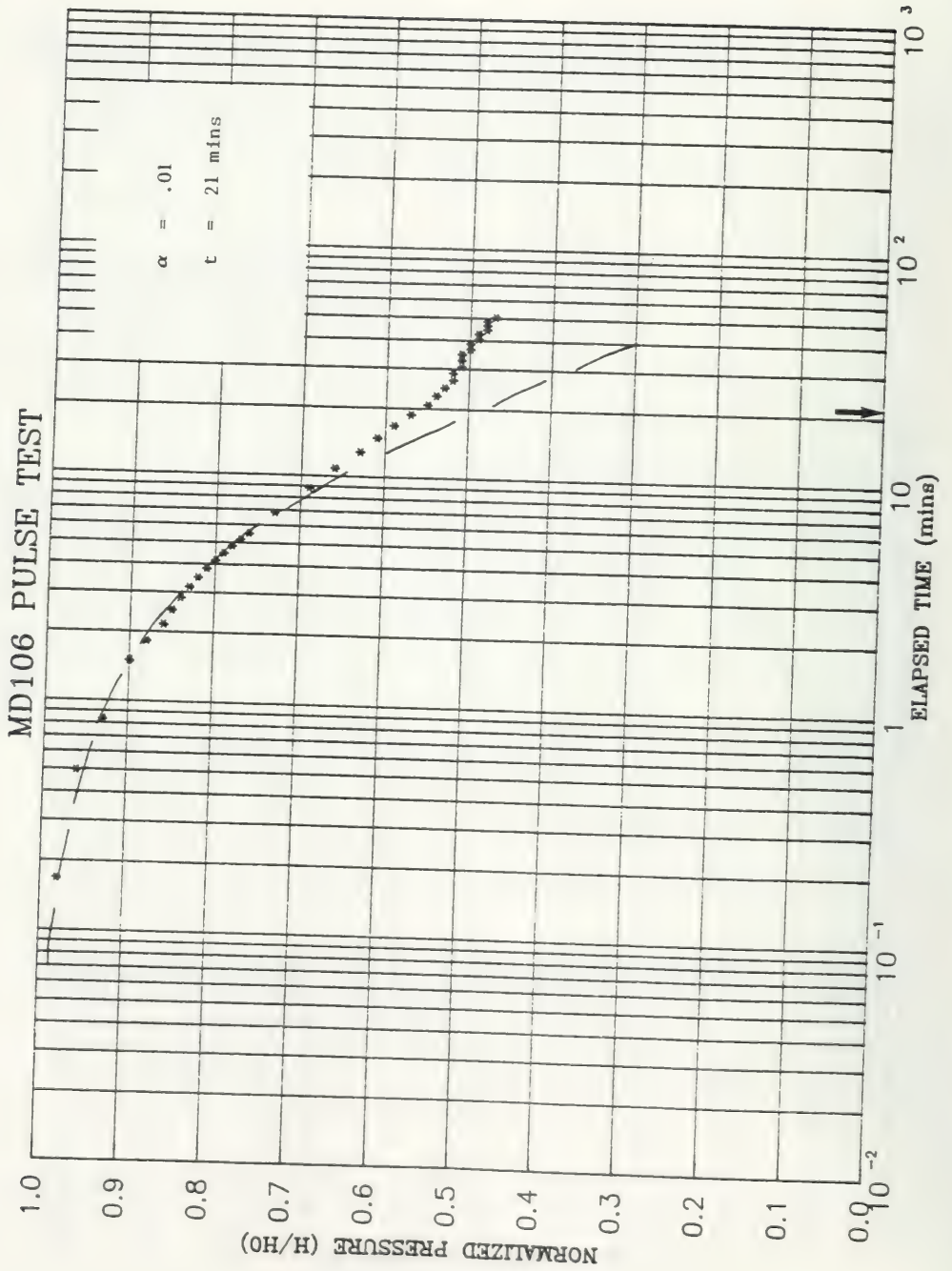
APPENDIX I2

Data Plots and Type Curve Analyses
Piston Pulse Tests

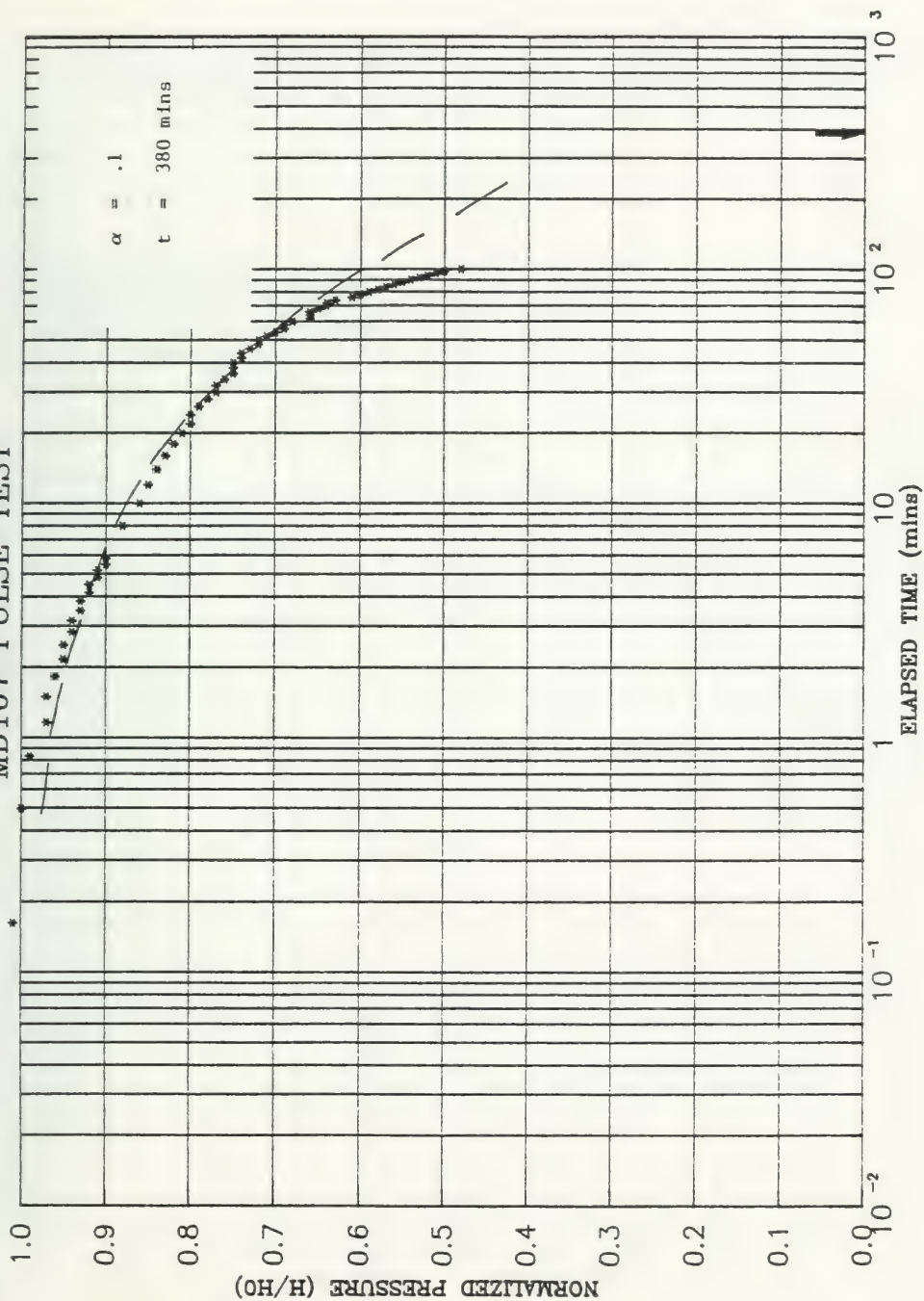
Borehole MDMW-1

MD105 PULSE TEST

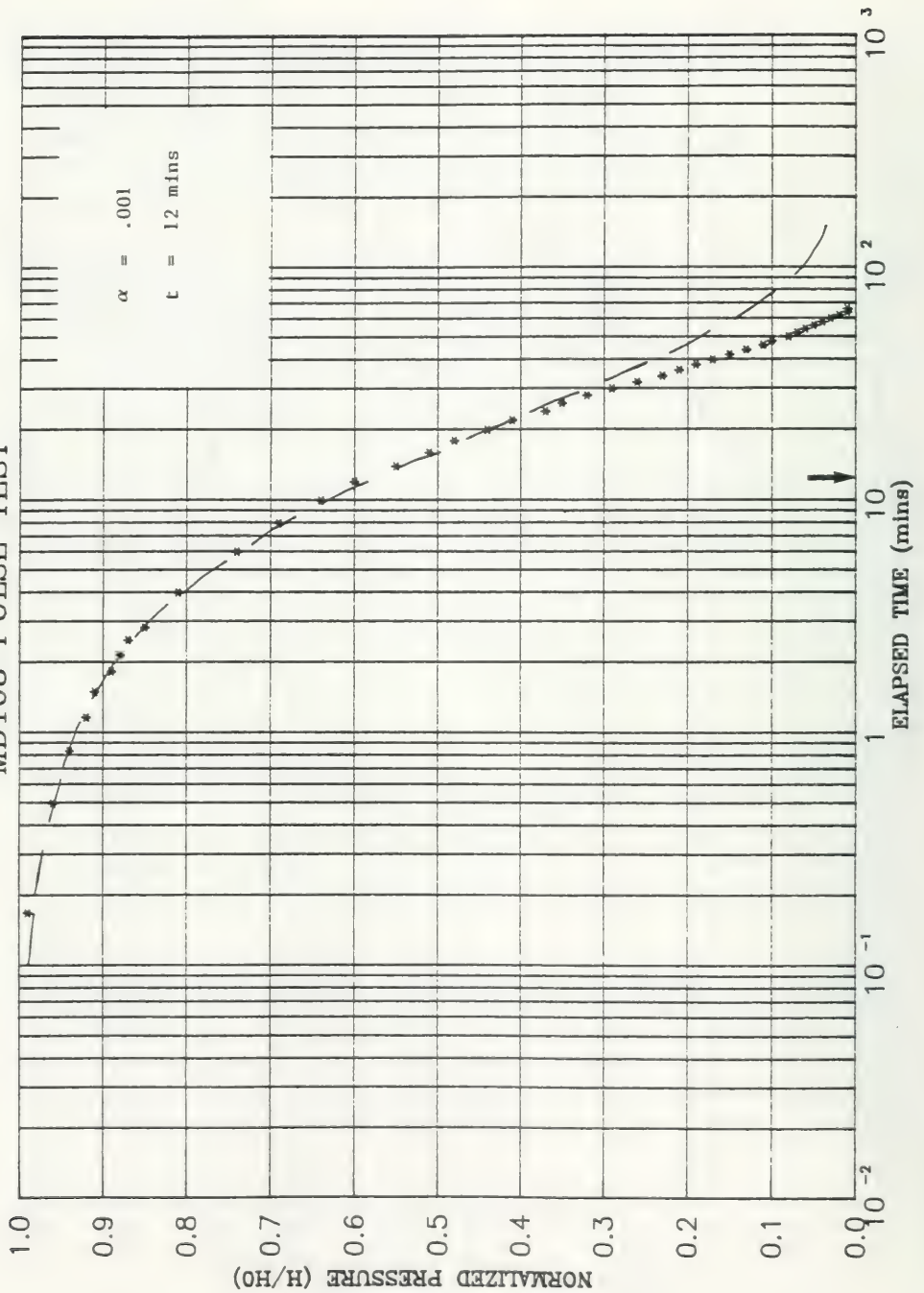




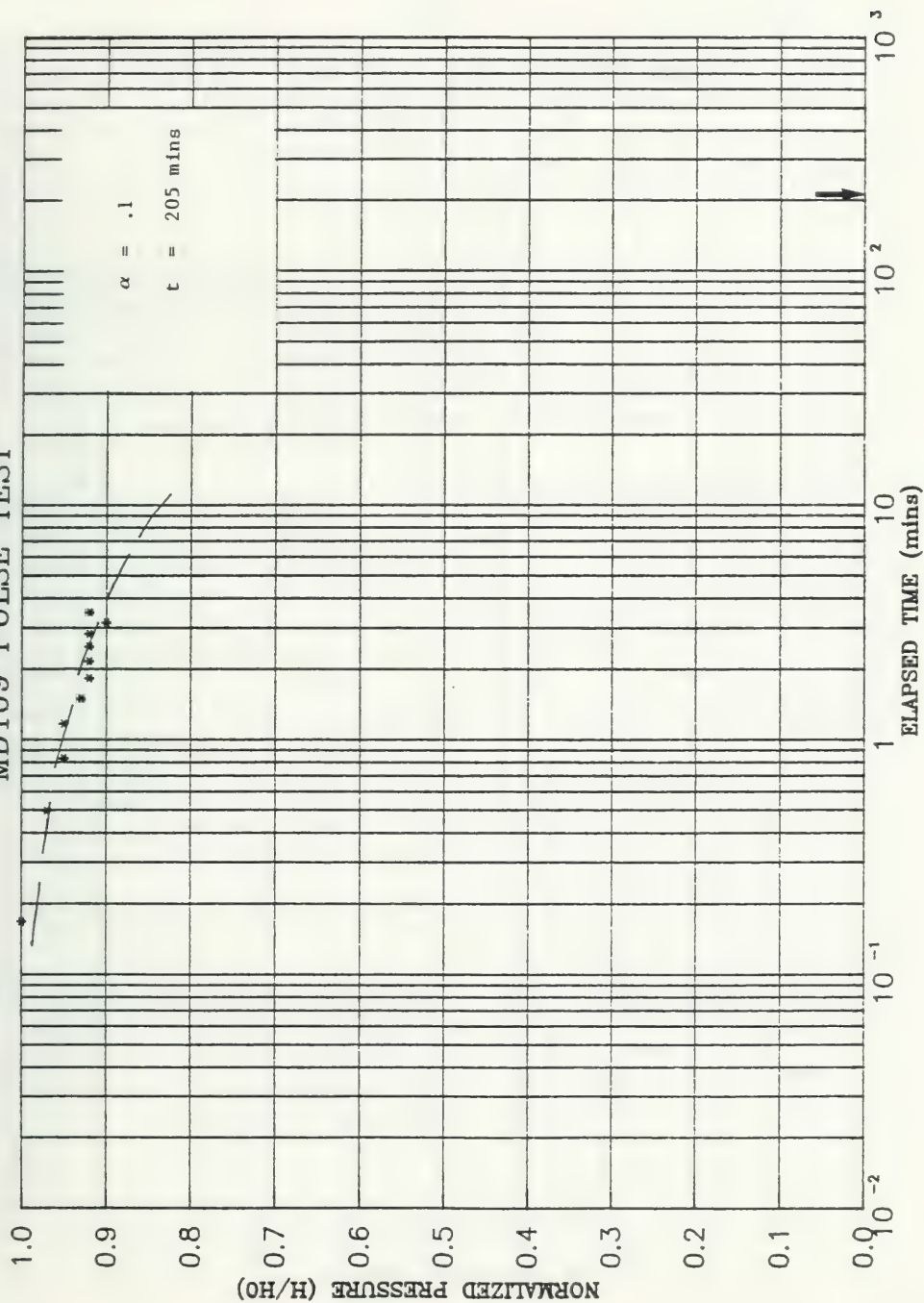
MD107 PULSE TEST



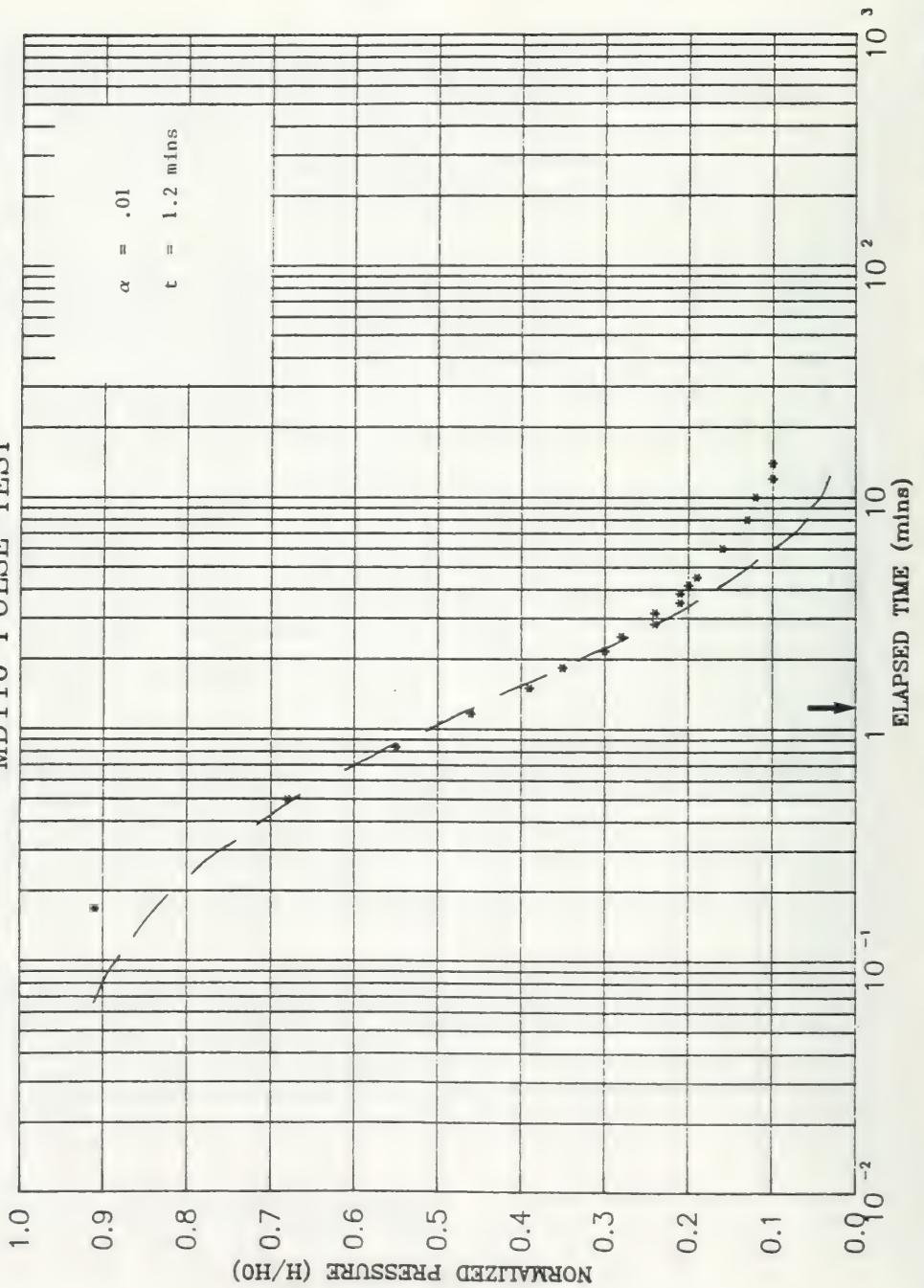
MD108 PULSE TEST



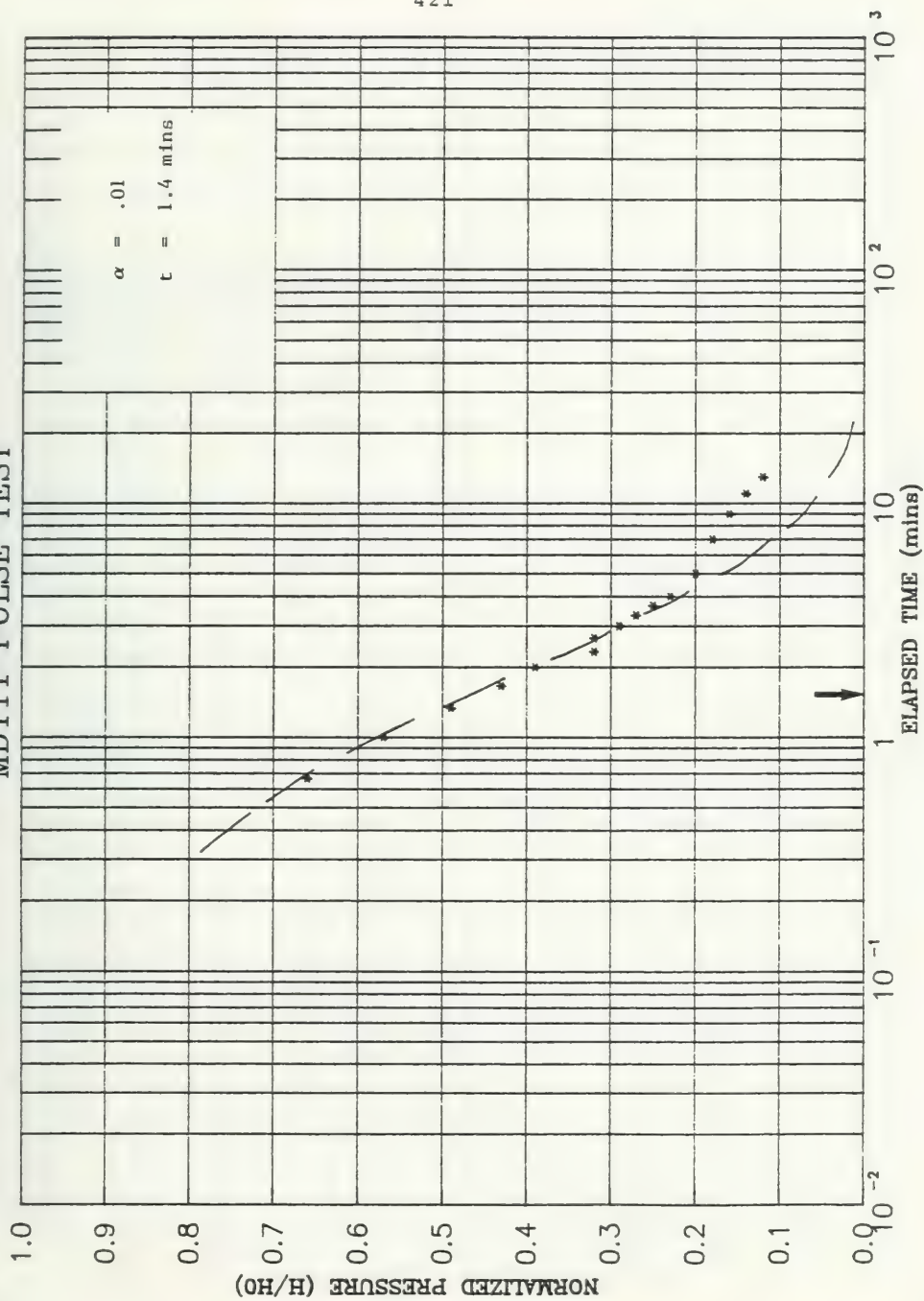
MD109 PULSE TEST



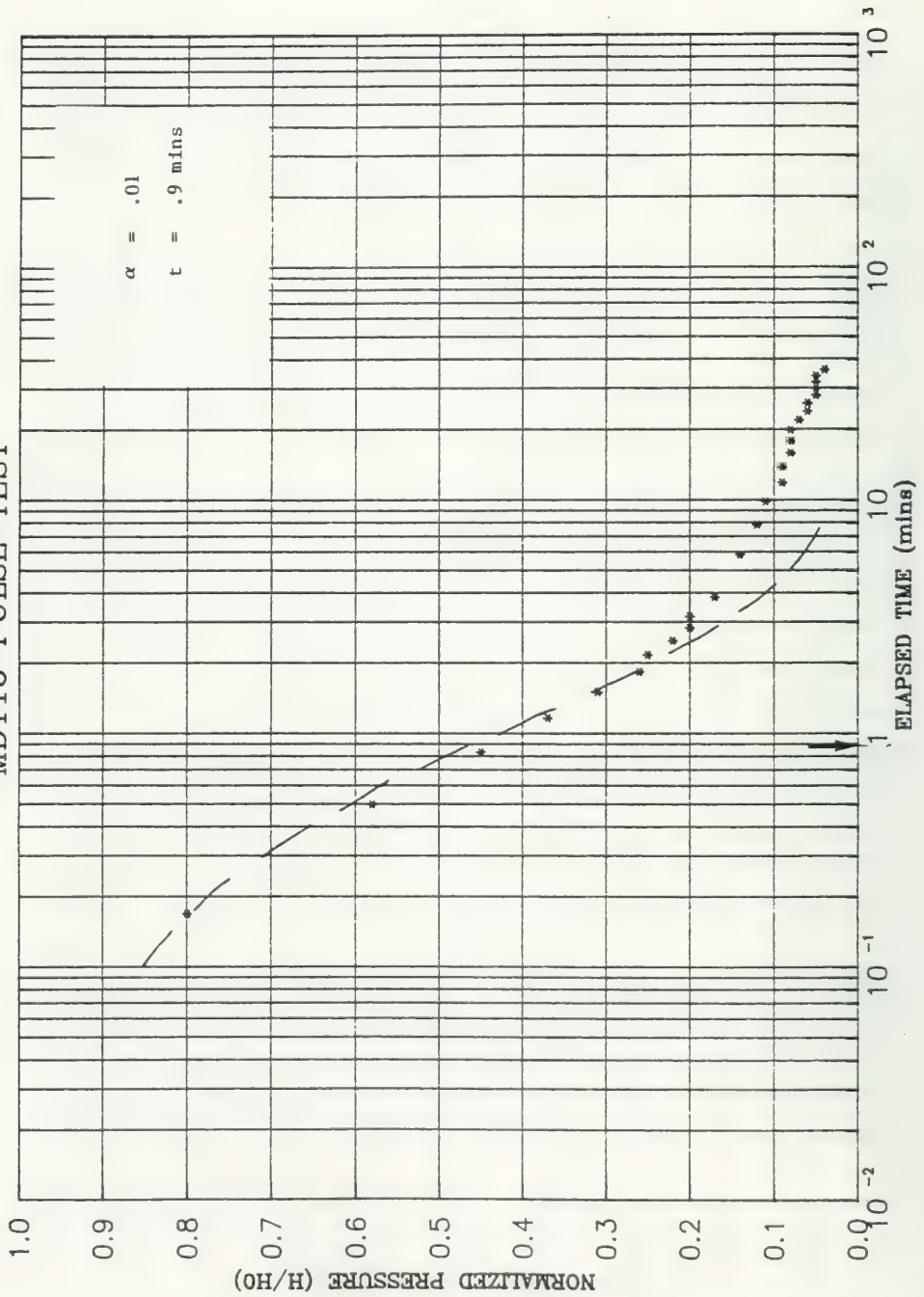
MD110 PULSE TEST



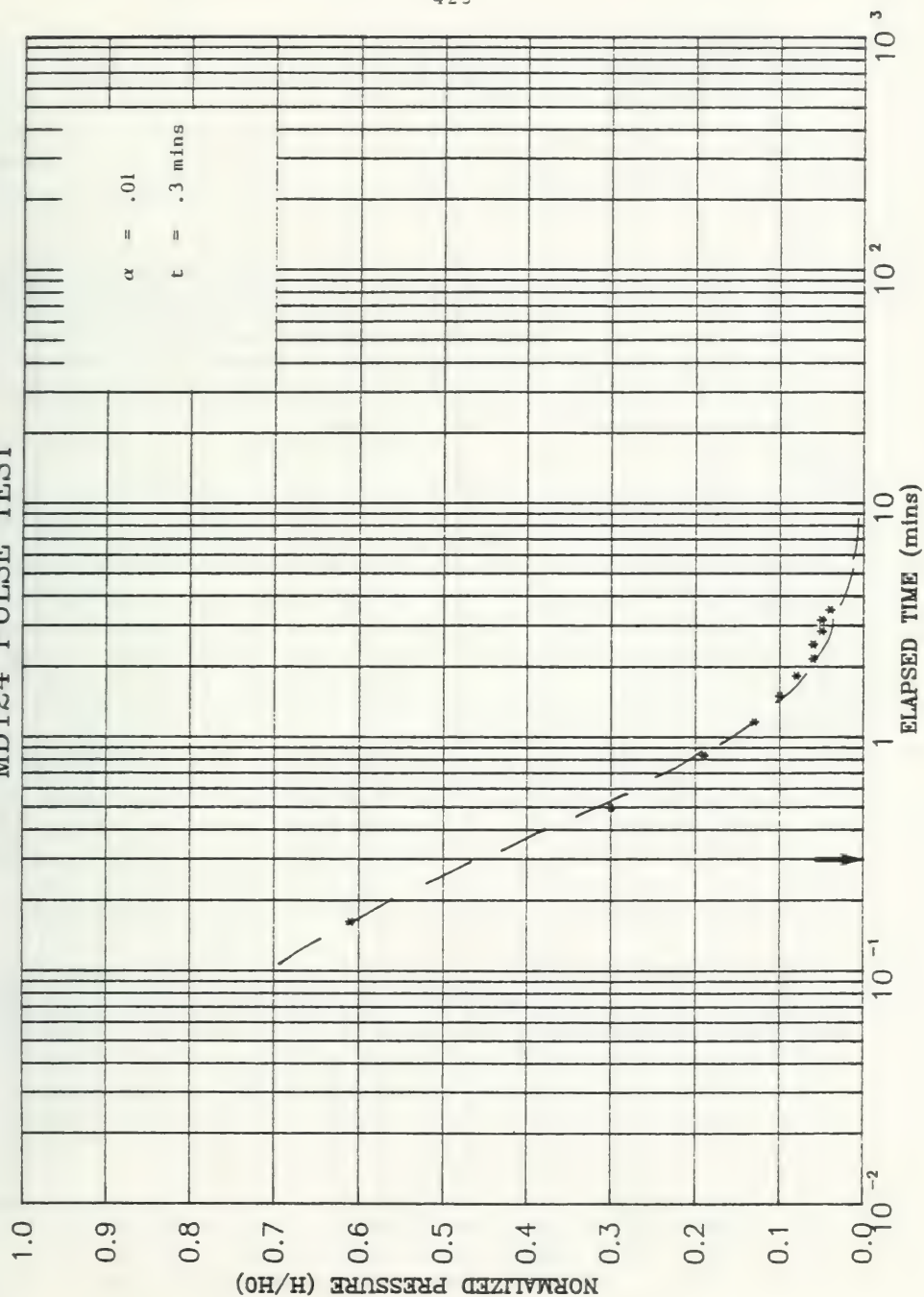
MD111 PULSE TEST



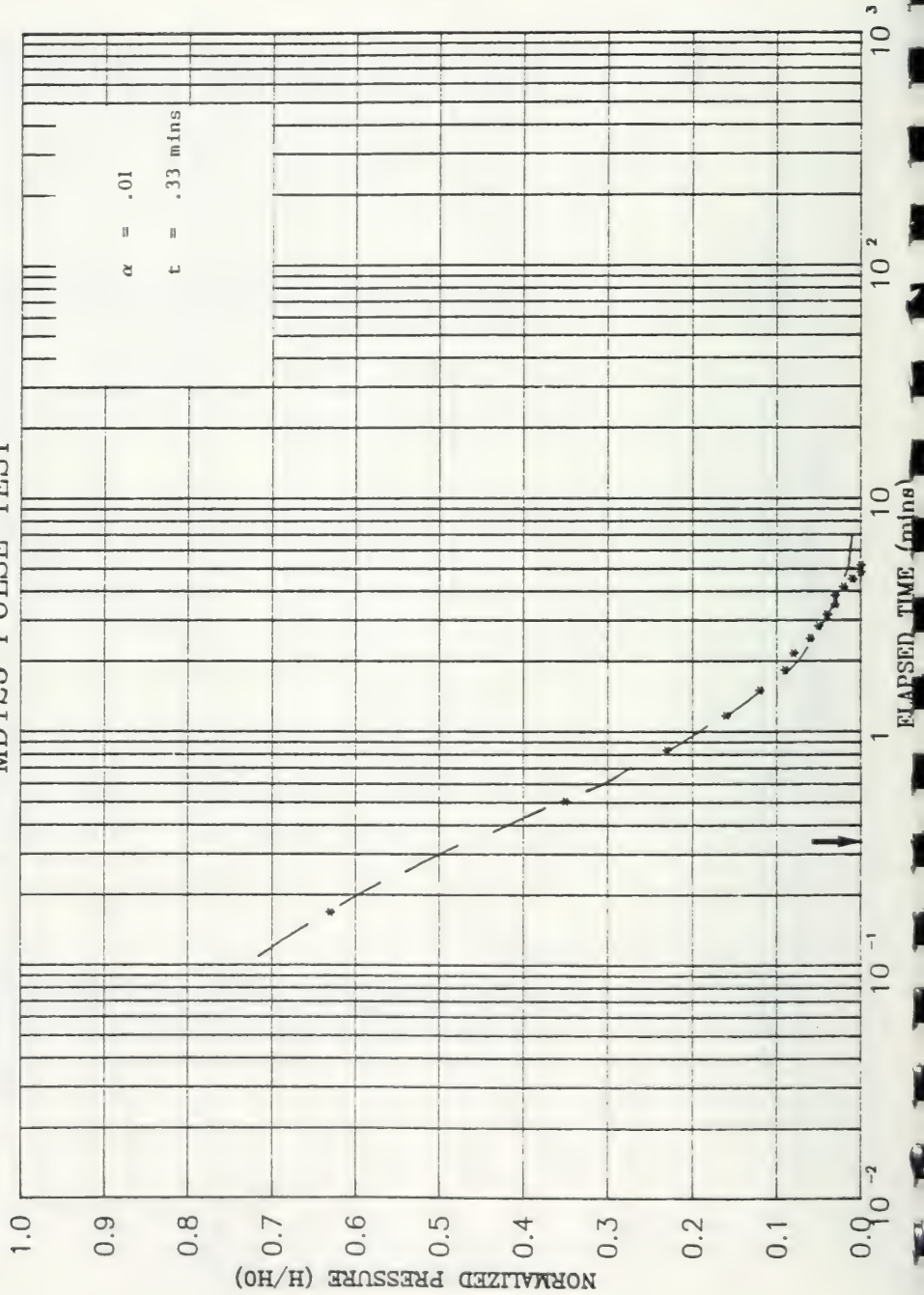
MD116 PULSE TEST



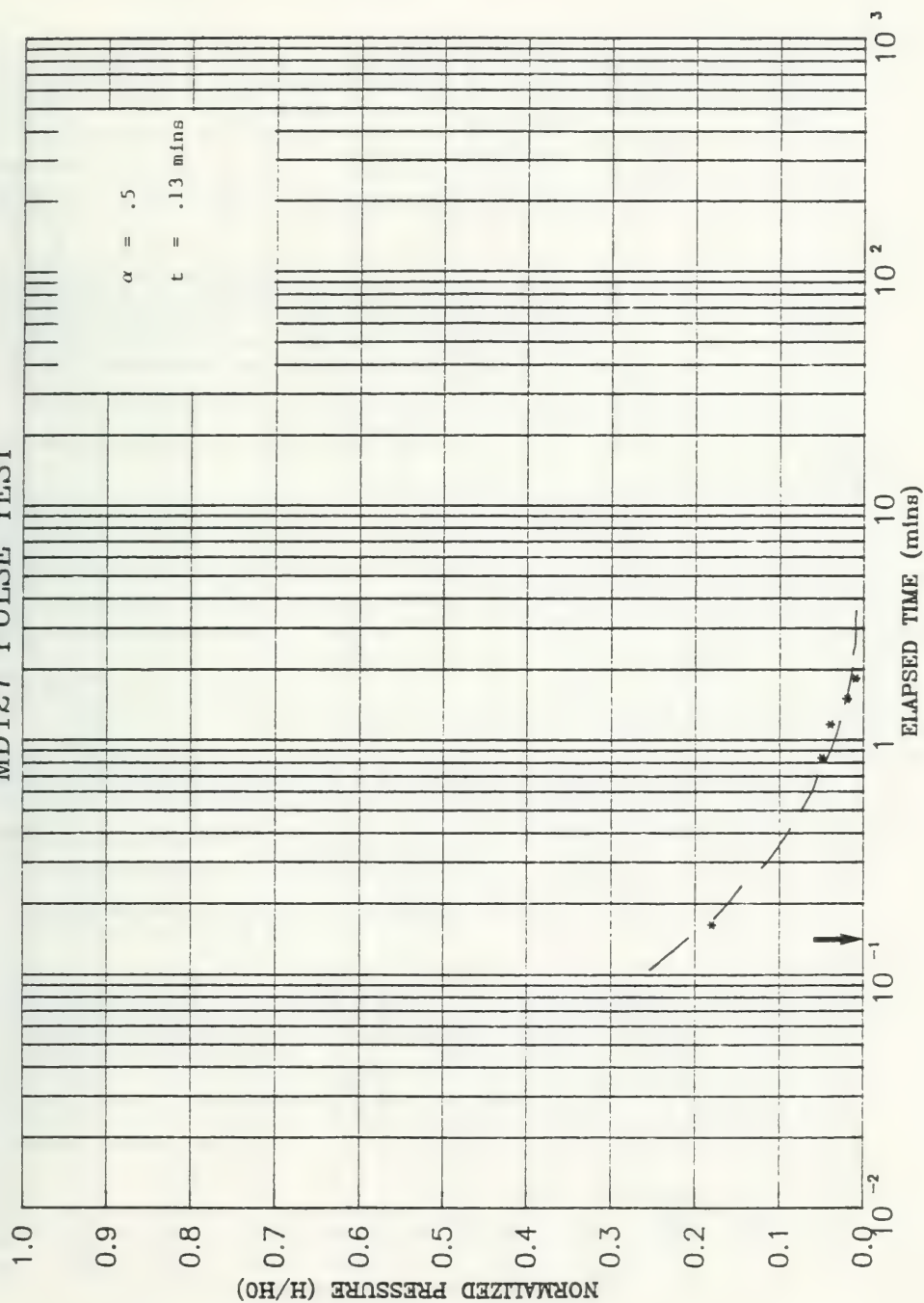
MD124 PULSE TEST



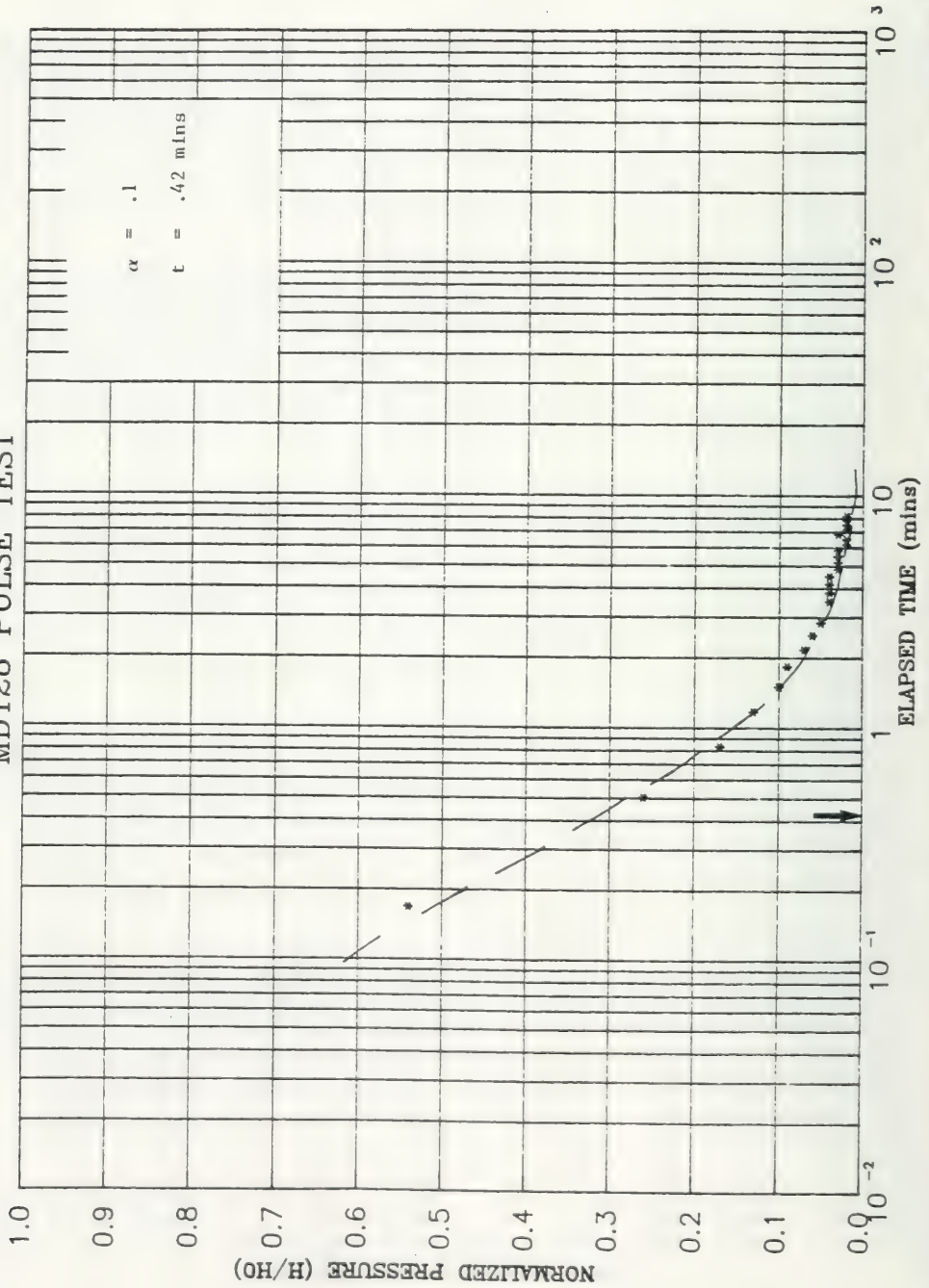
MD125 PULSE TEST



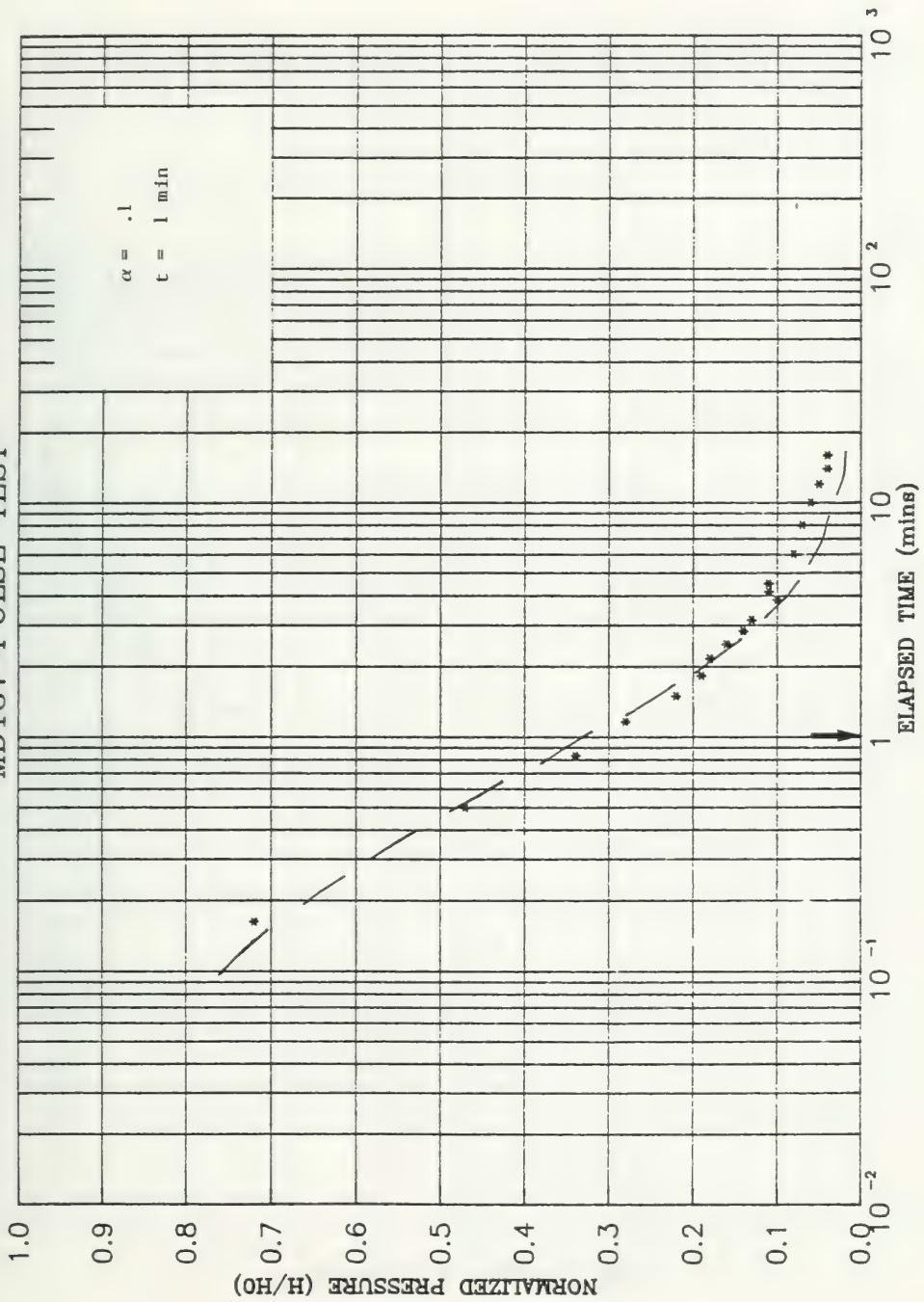
MD127 PULSE TEST



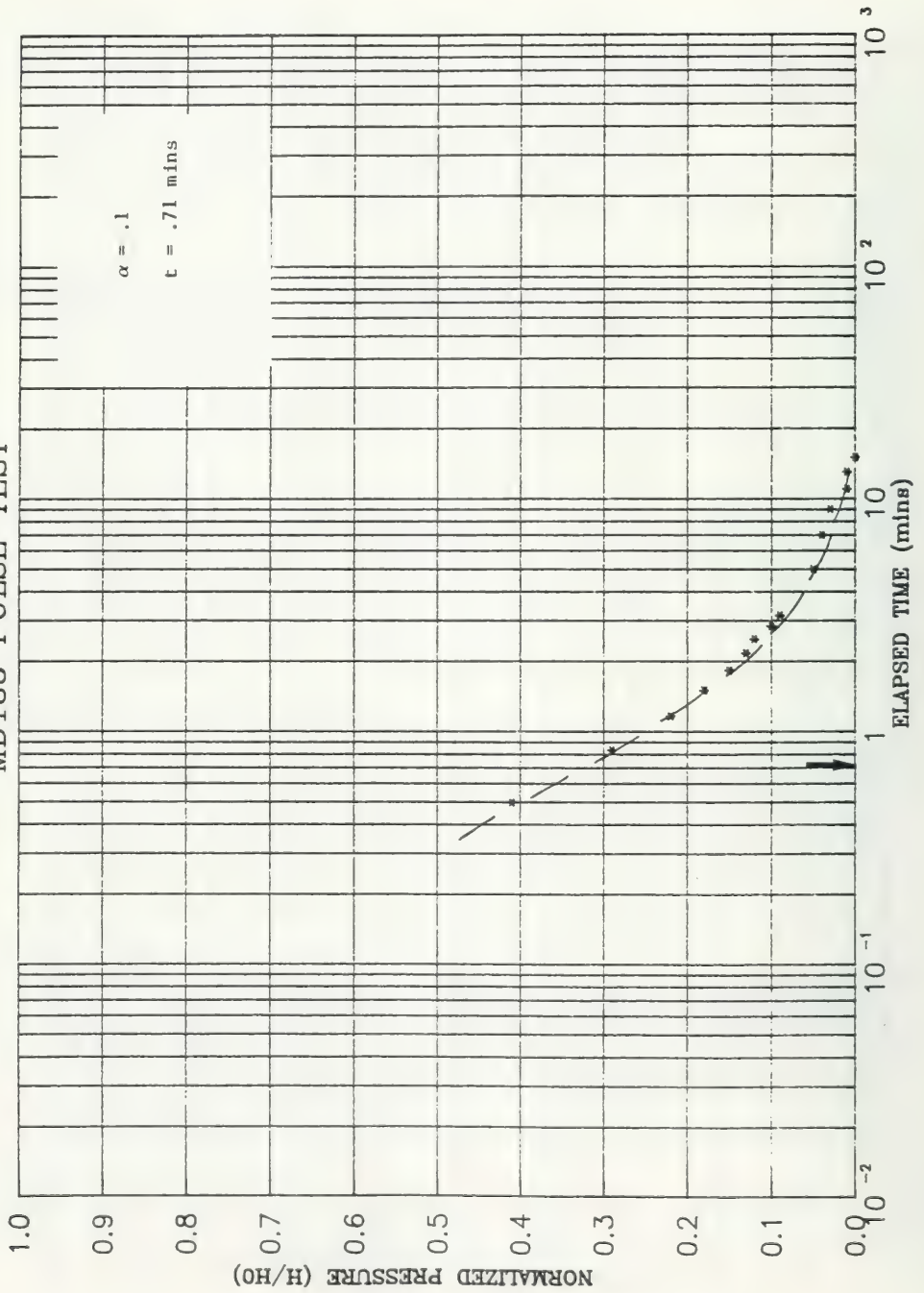
MD128 PULSE TEST



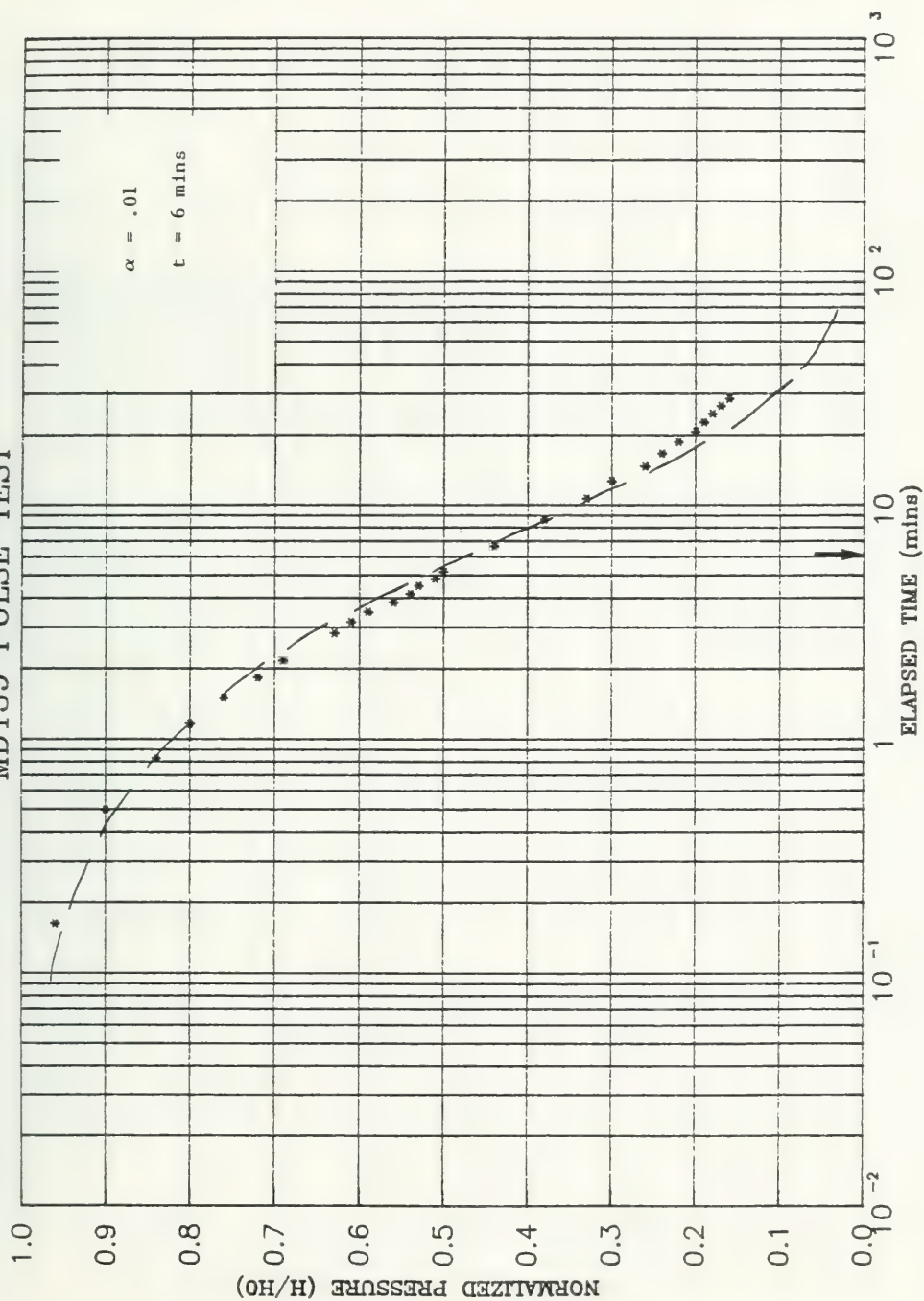
MD137 PULSE TEST



MD138 PULSE TEST



MD139 PULSE TEST

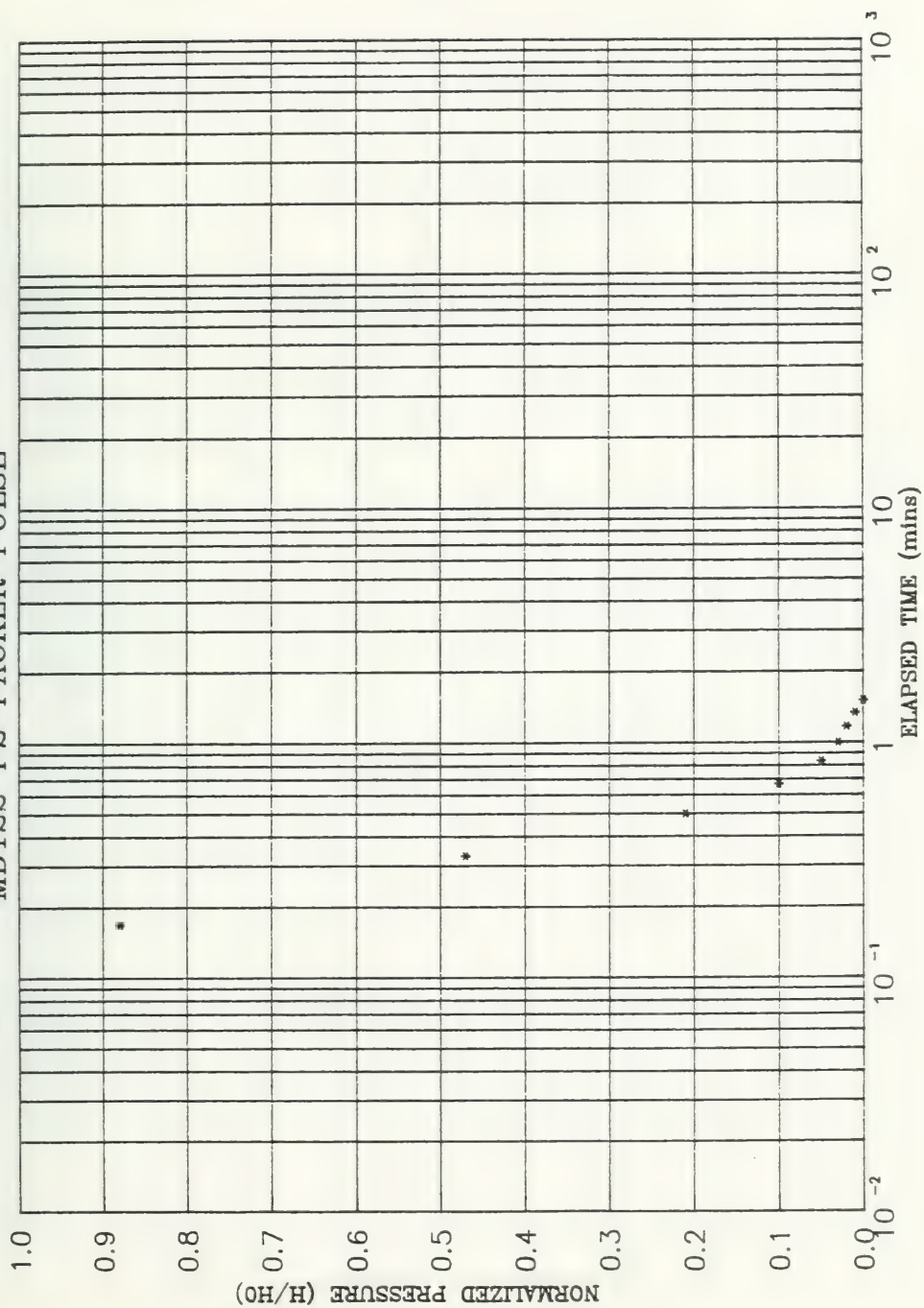


APPENDIX I3

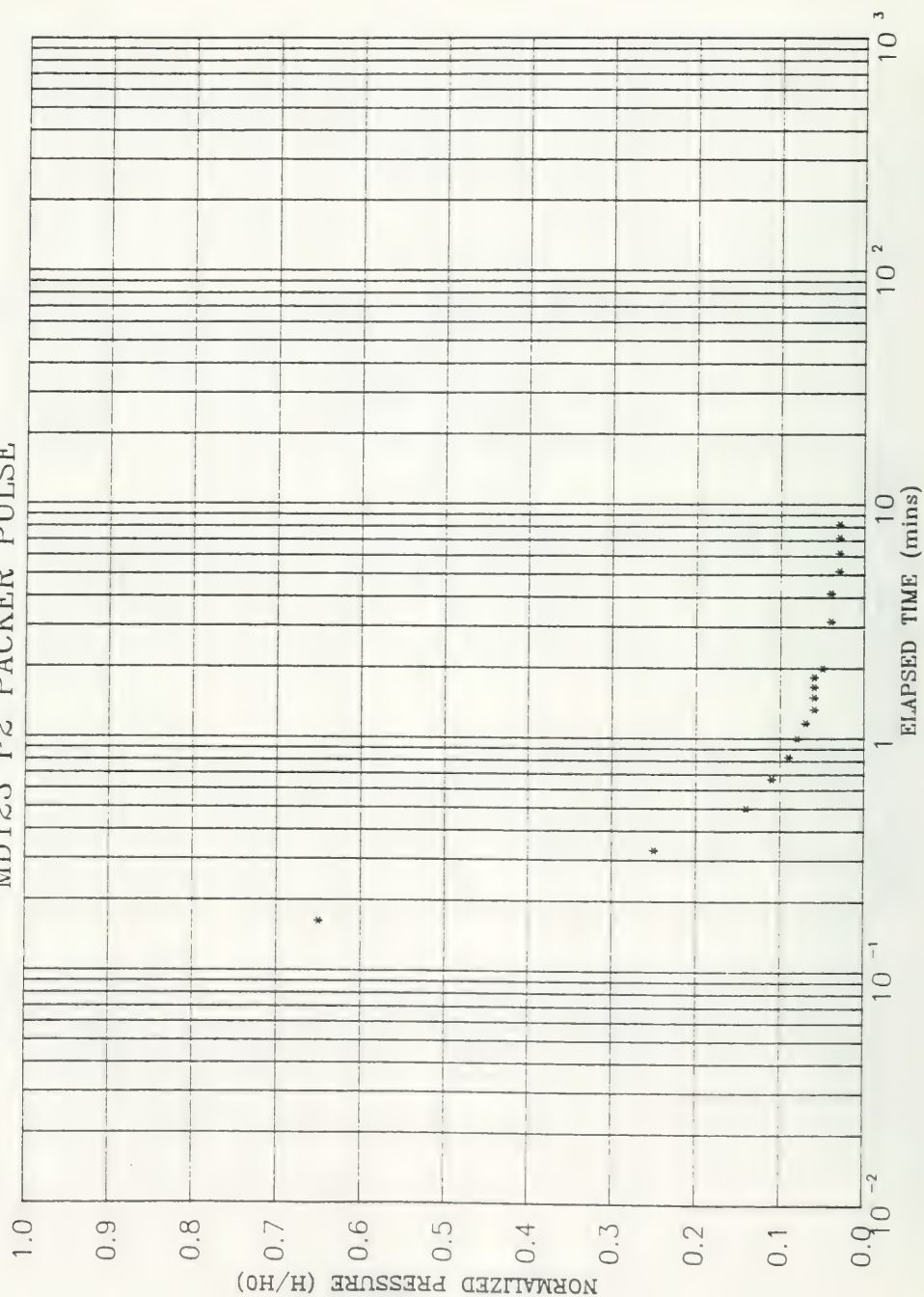
Data Plots and Type Curve Analyses
(P2) Packer Pulse Tests

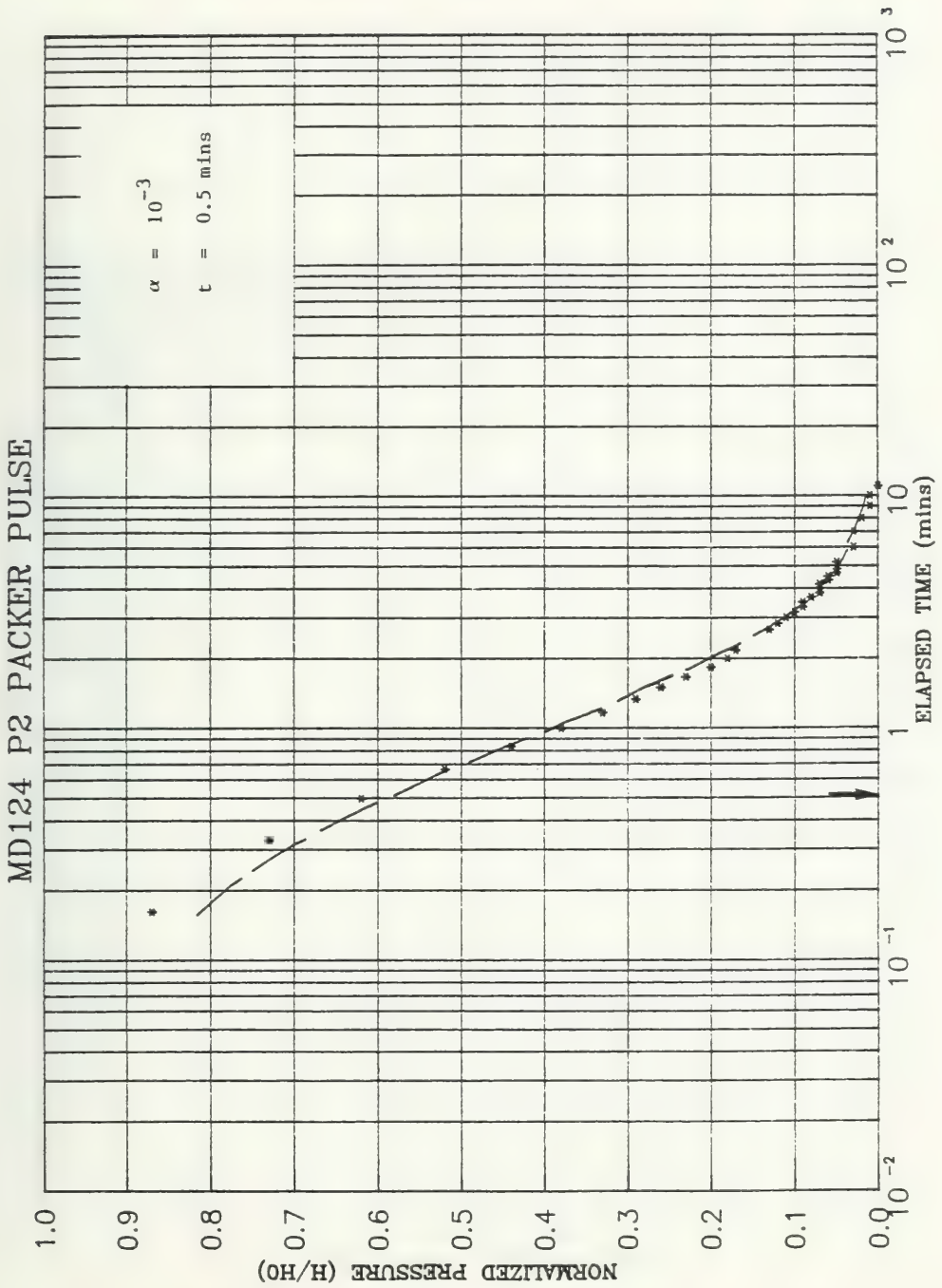
Borehole MDMW-1

MD122 P2 PACKER PULSE

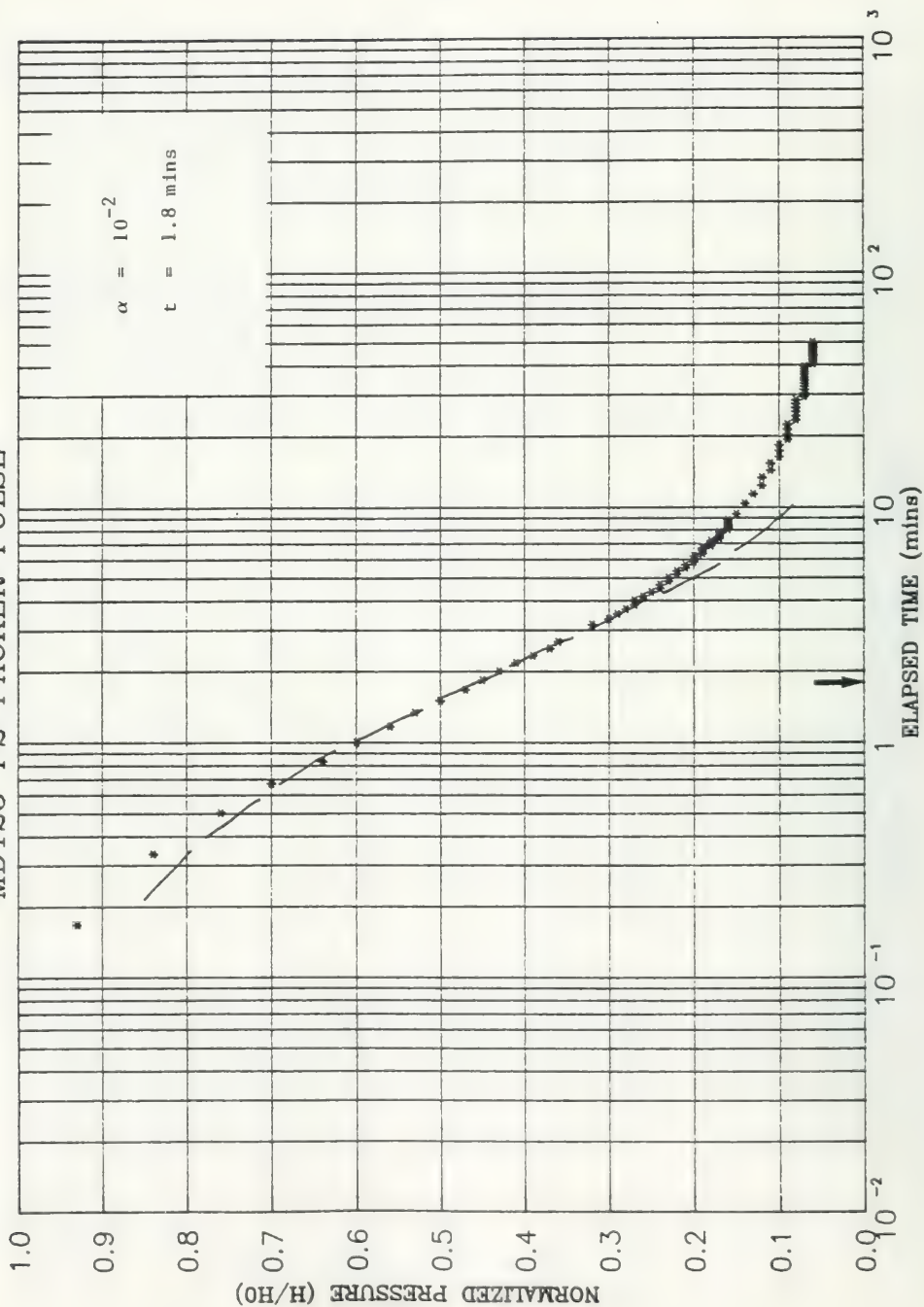


MD123 P2 PACKER PULSE

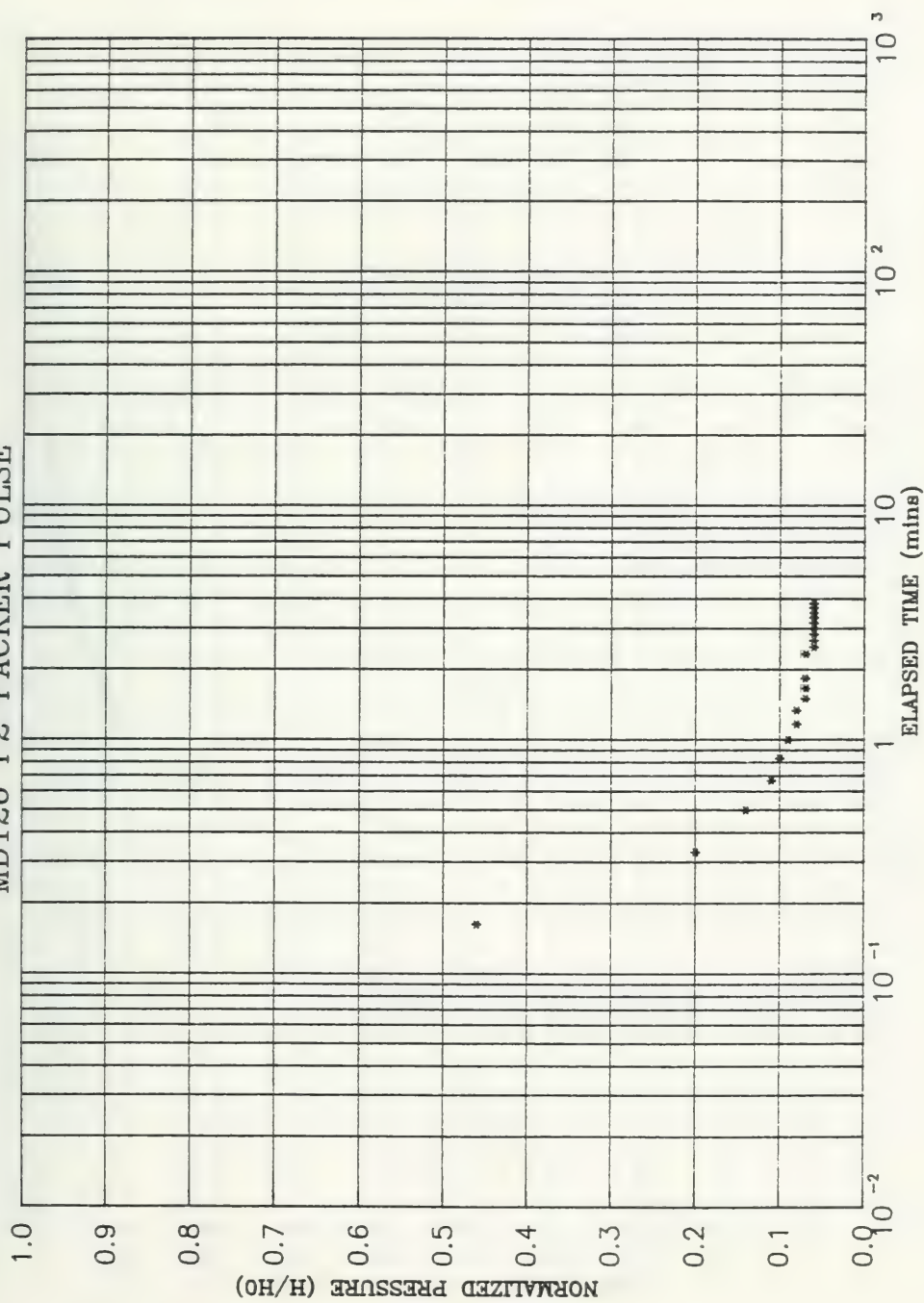




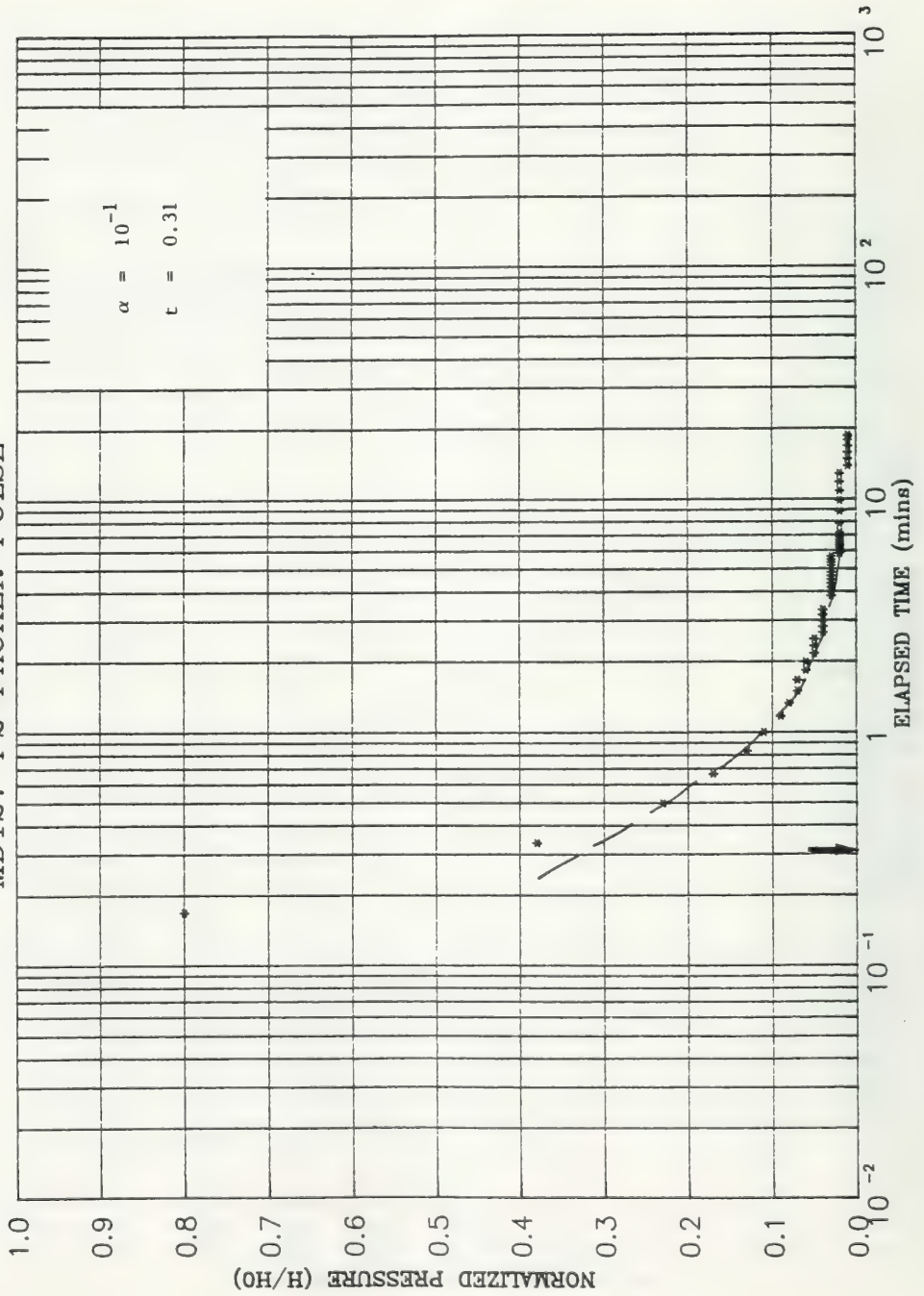
MD125 P2 PACKER PULSE



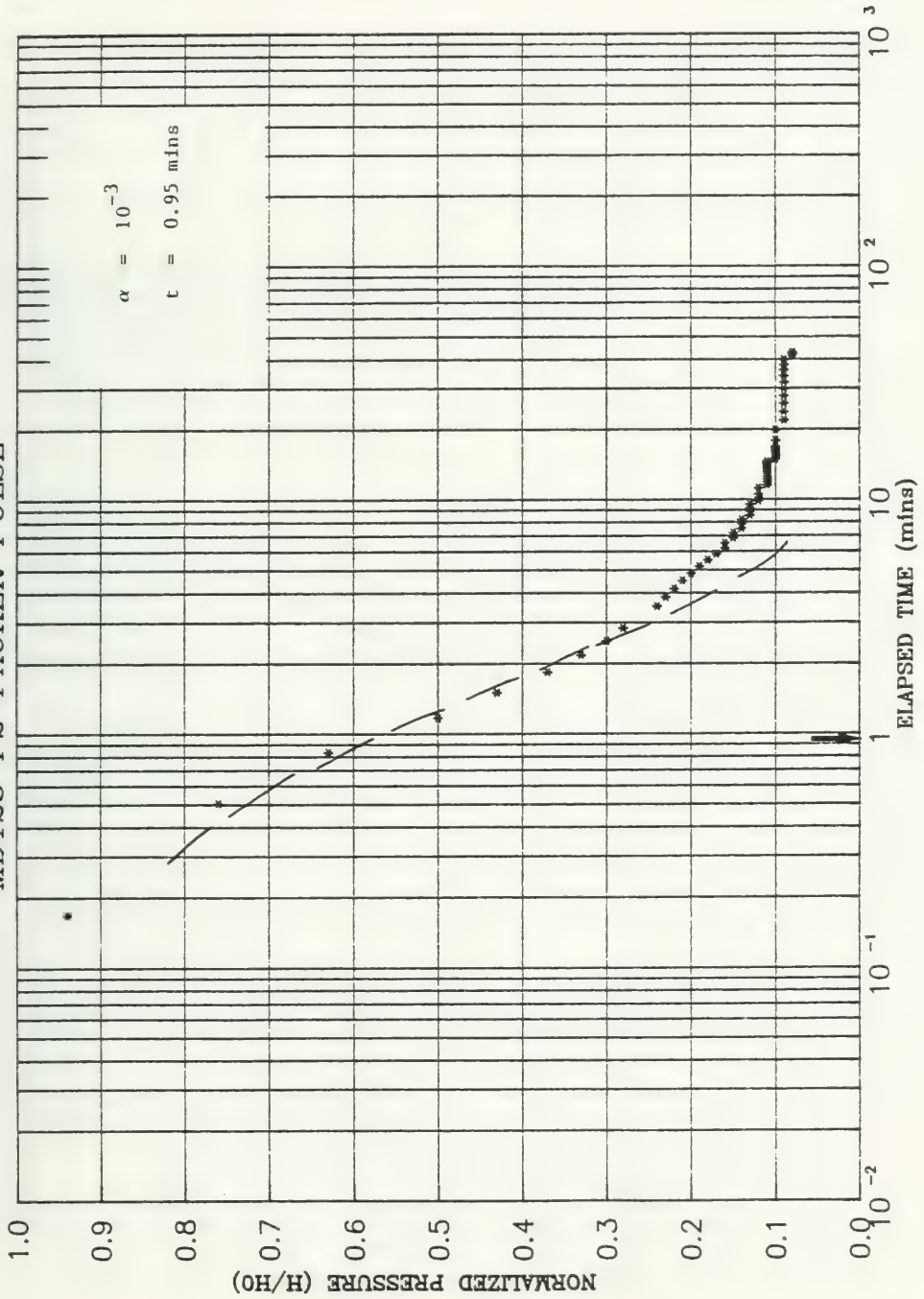
MD126 P2 PACKER PULSE



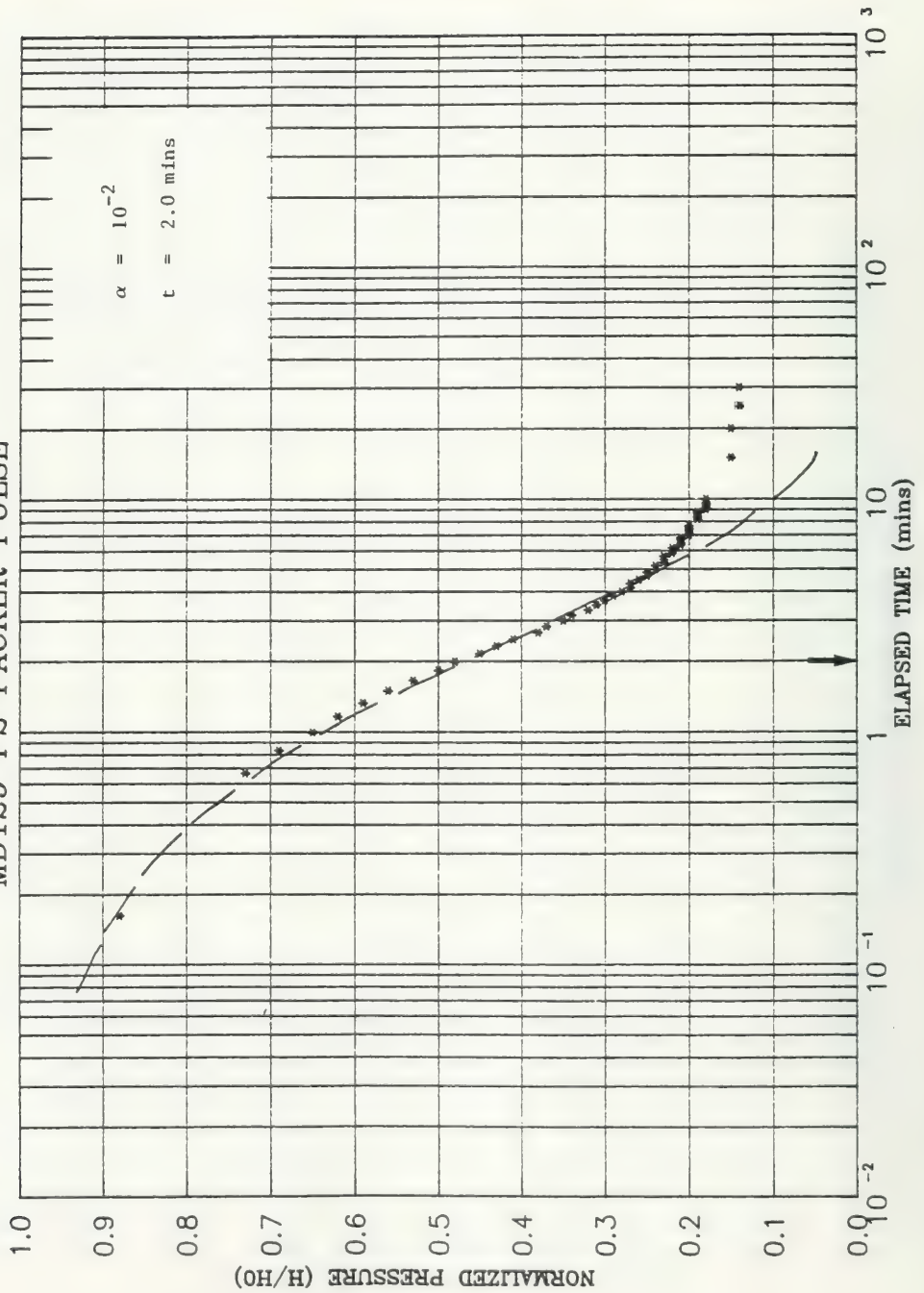
MD127 P2 PACKER PULSE



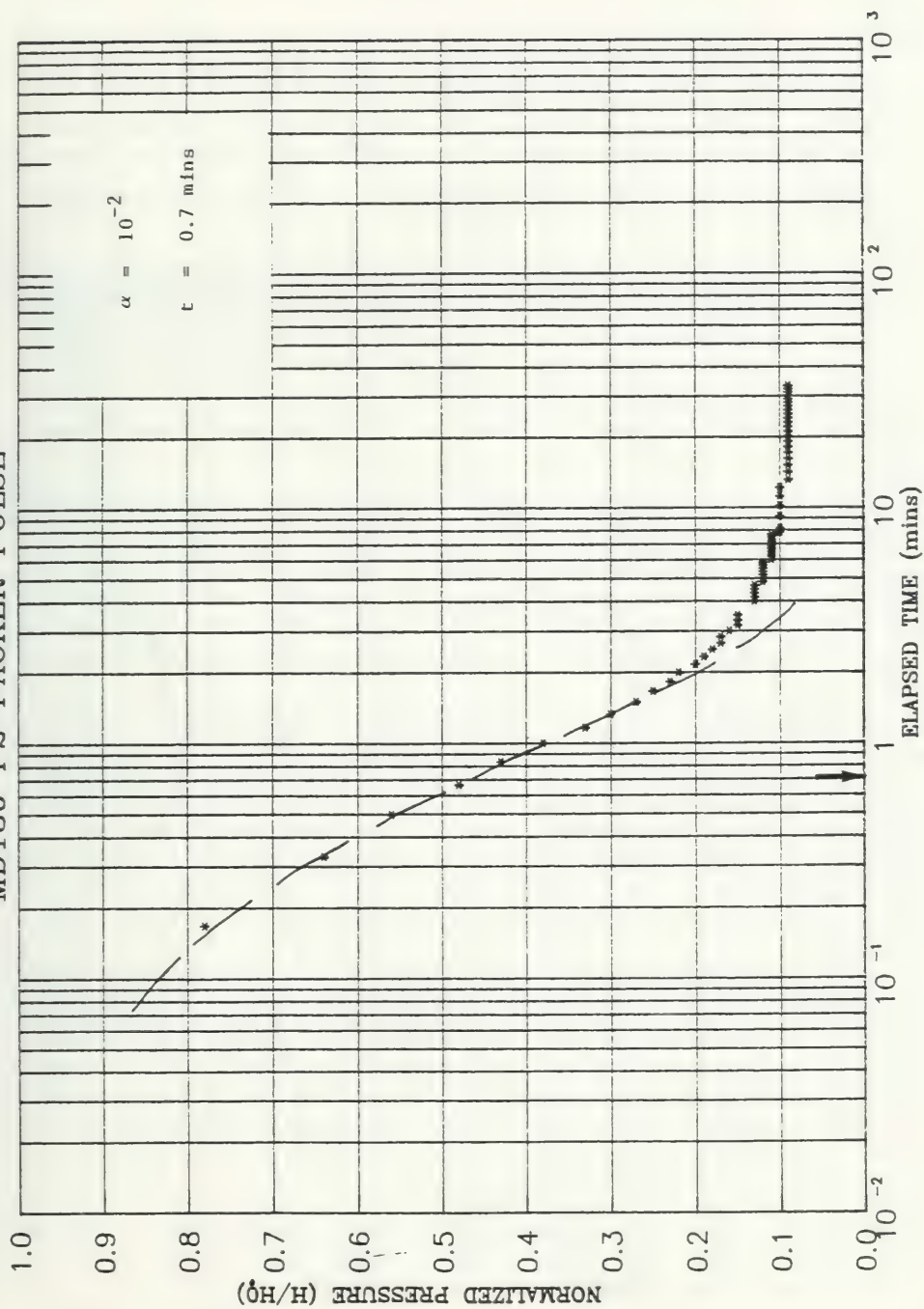
MD128 P2 PACKER PULSE

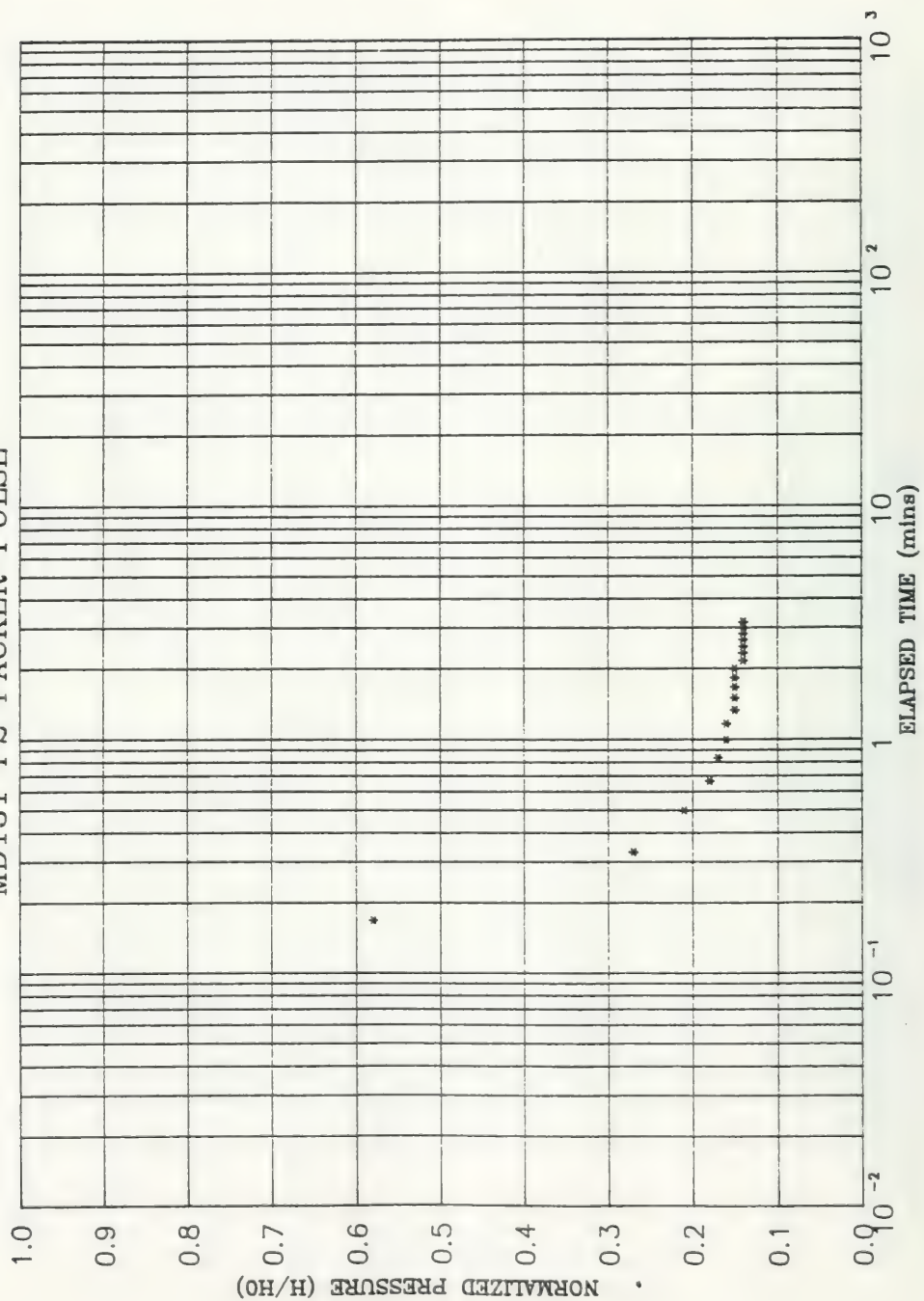
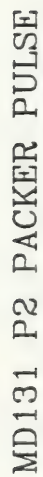


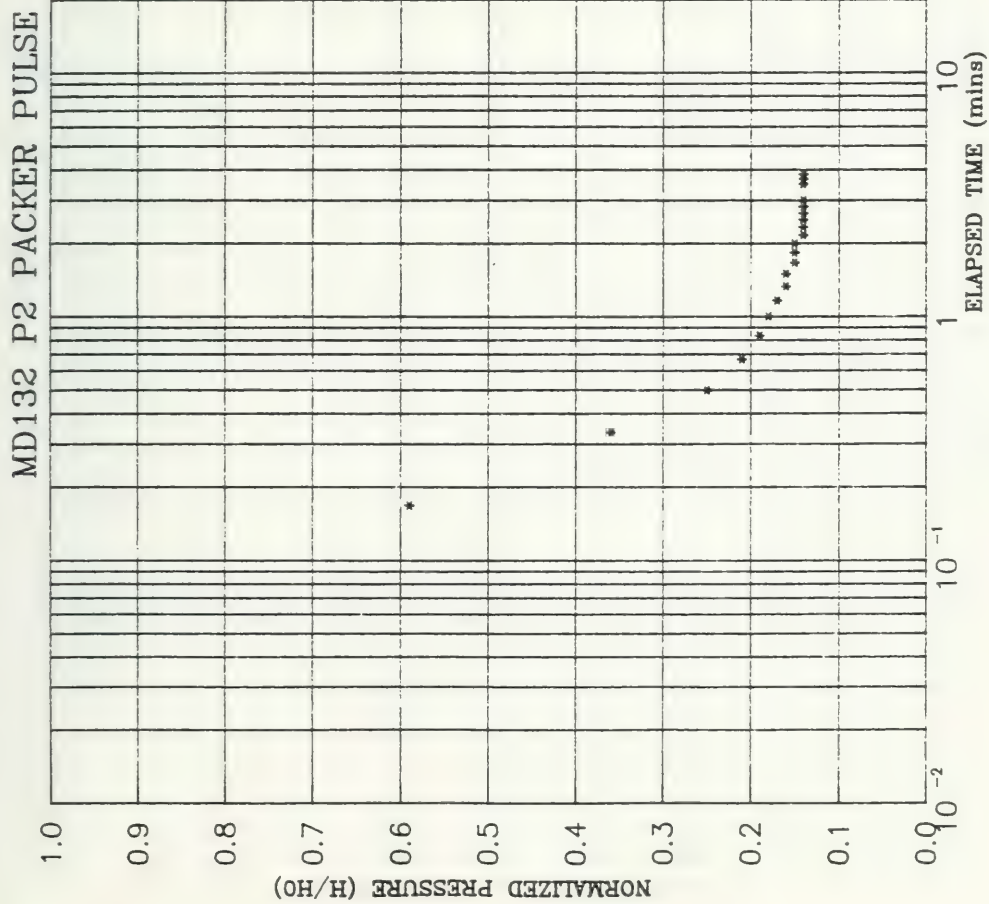
MD129 P2 PACKER PULSE



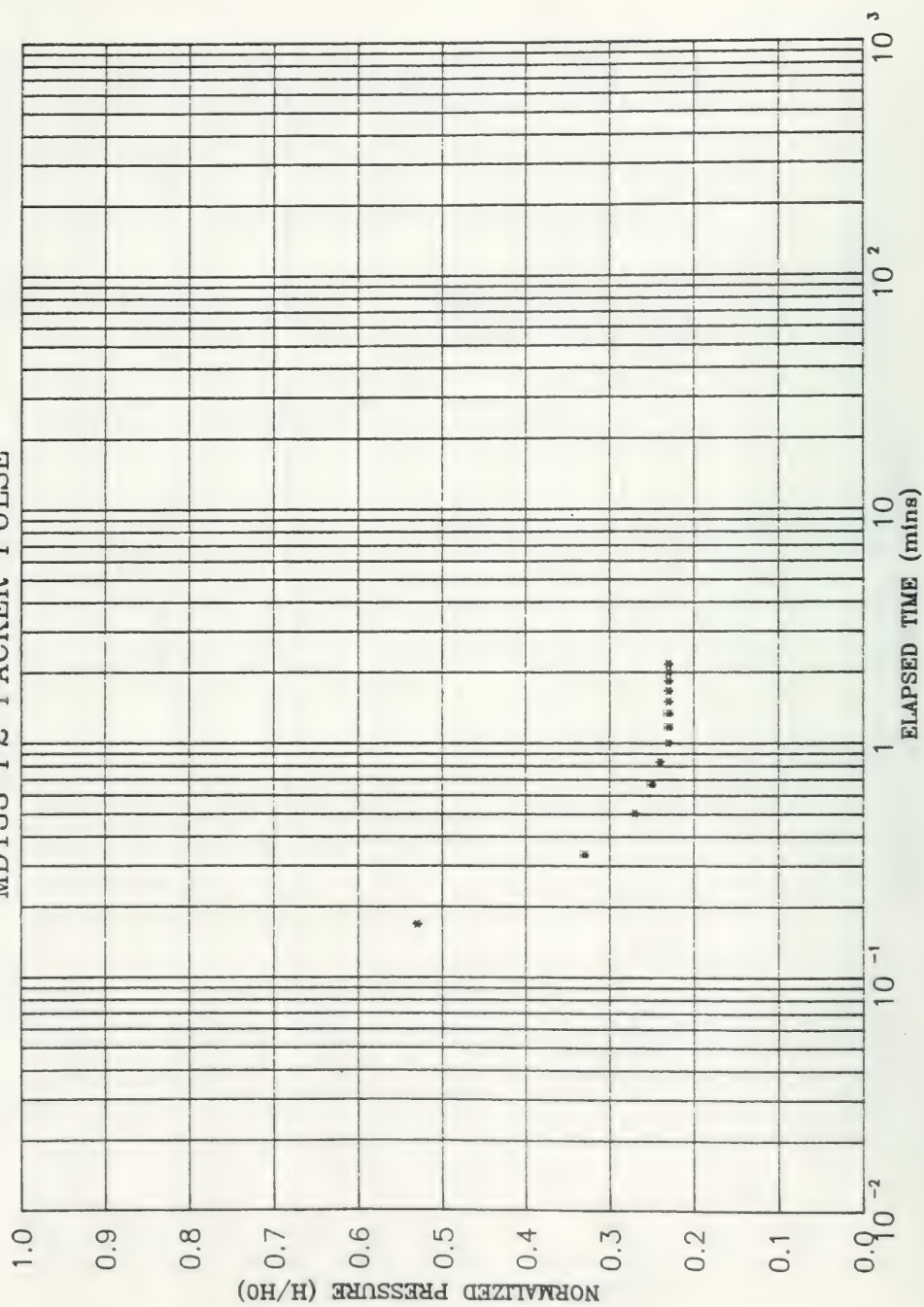
MD130 P2 PACKER PULSE



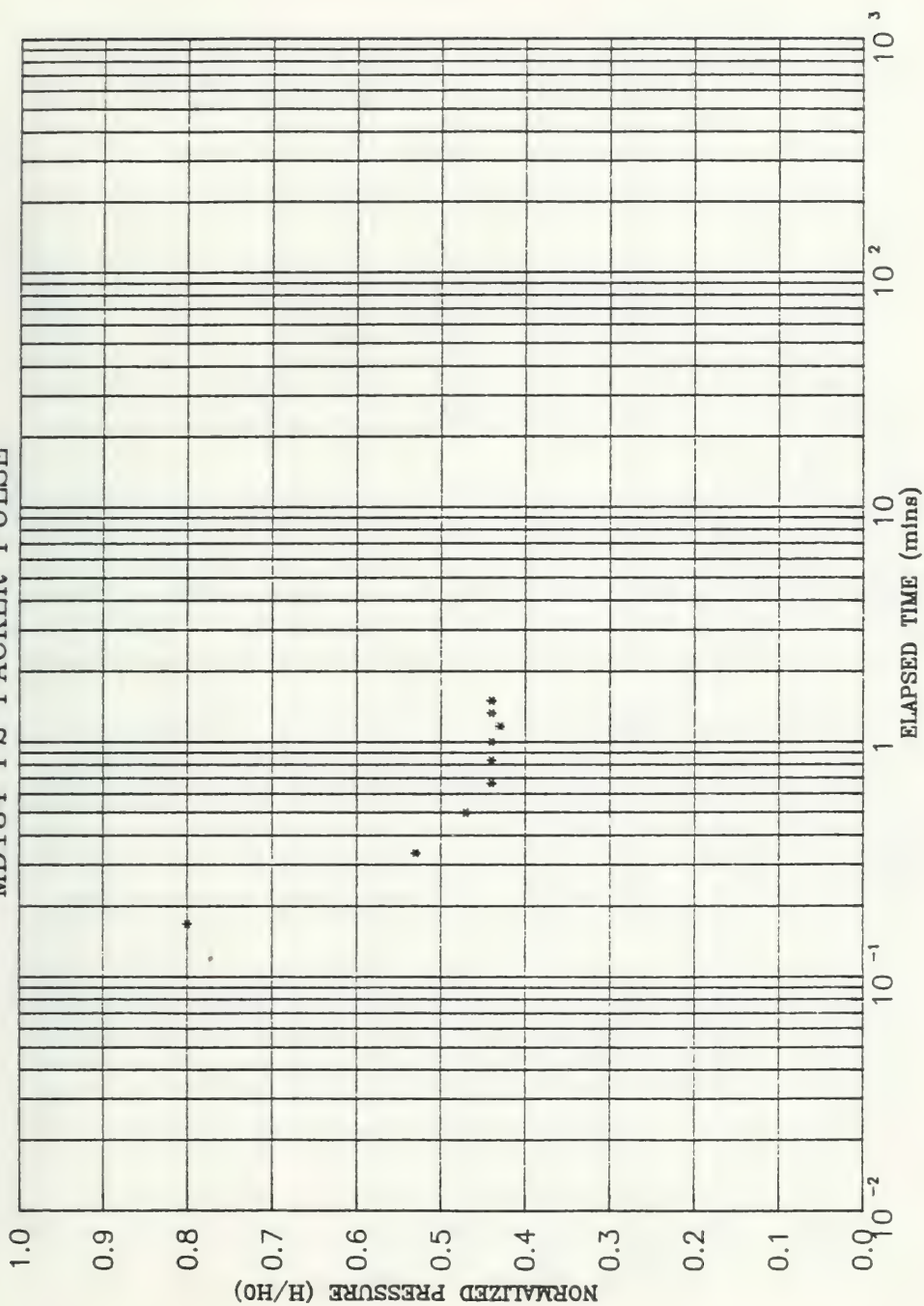




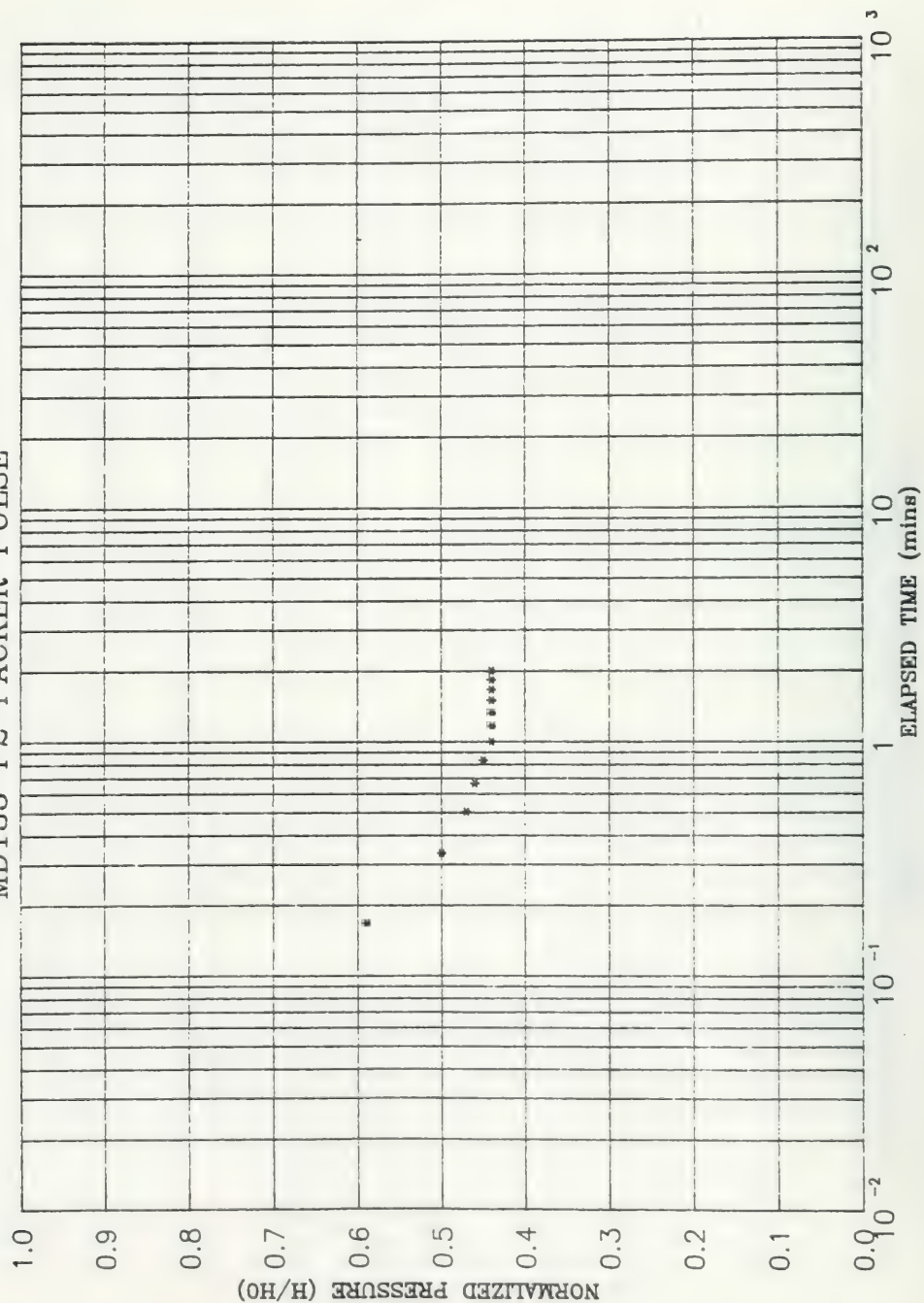
MD133 P2 PACKER PULSE

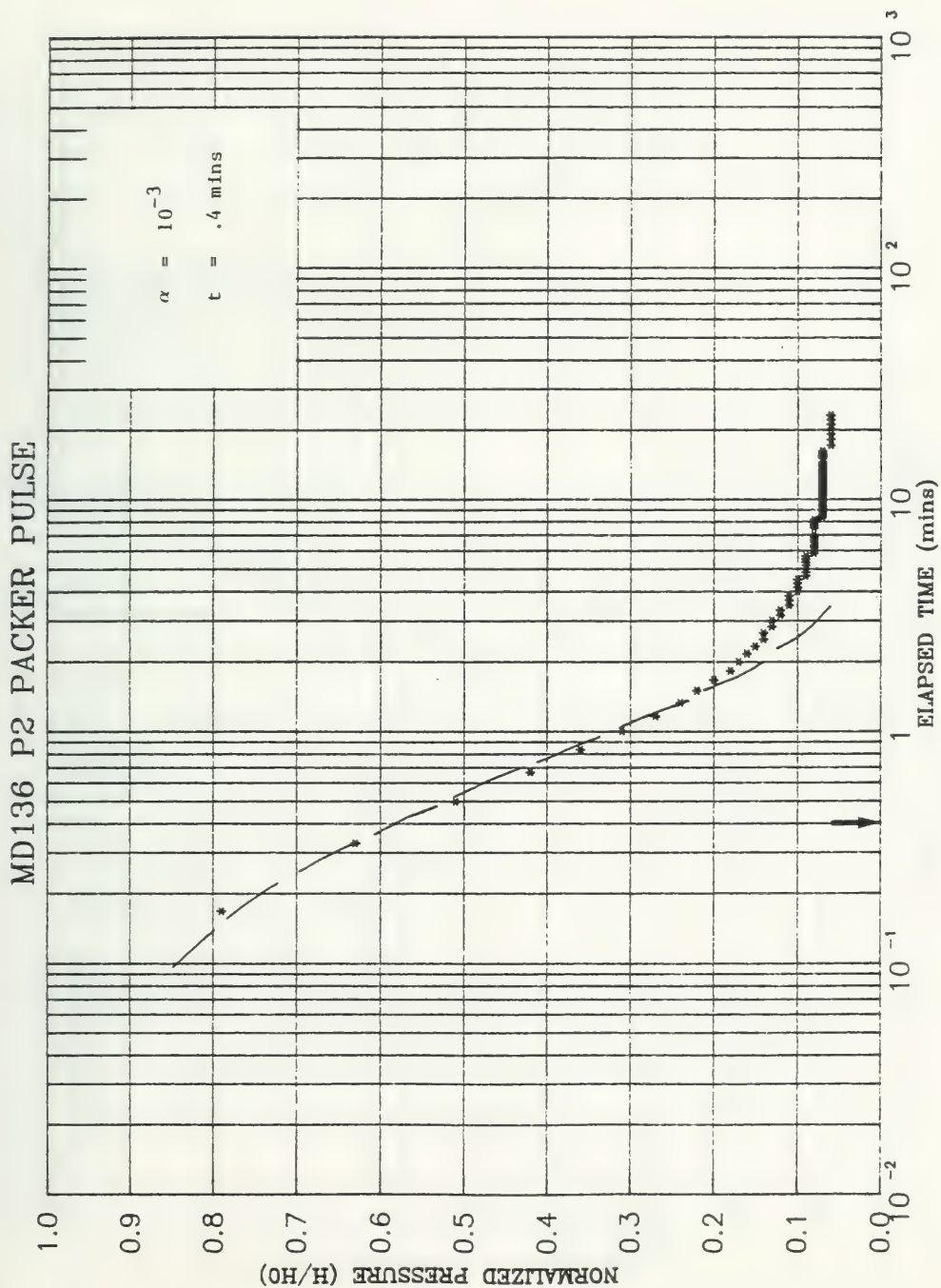


MD134 P2 PACKER PULSE

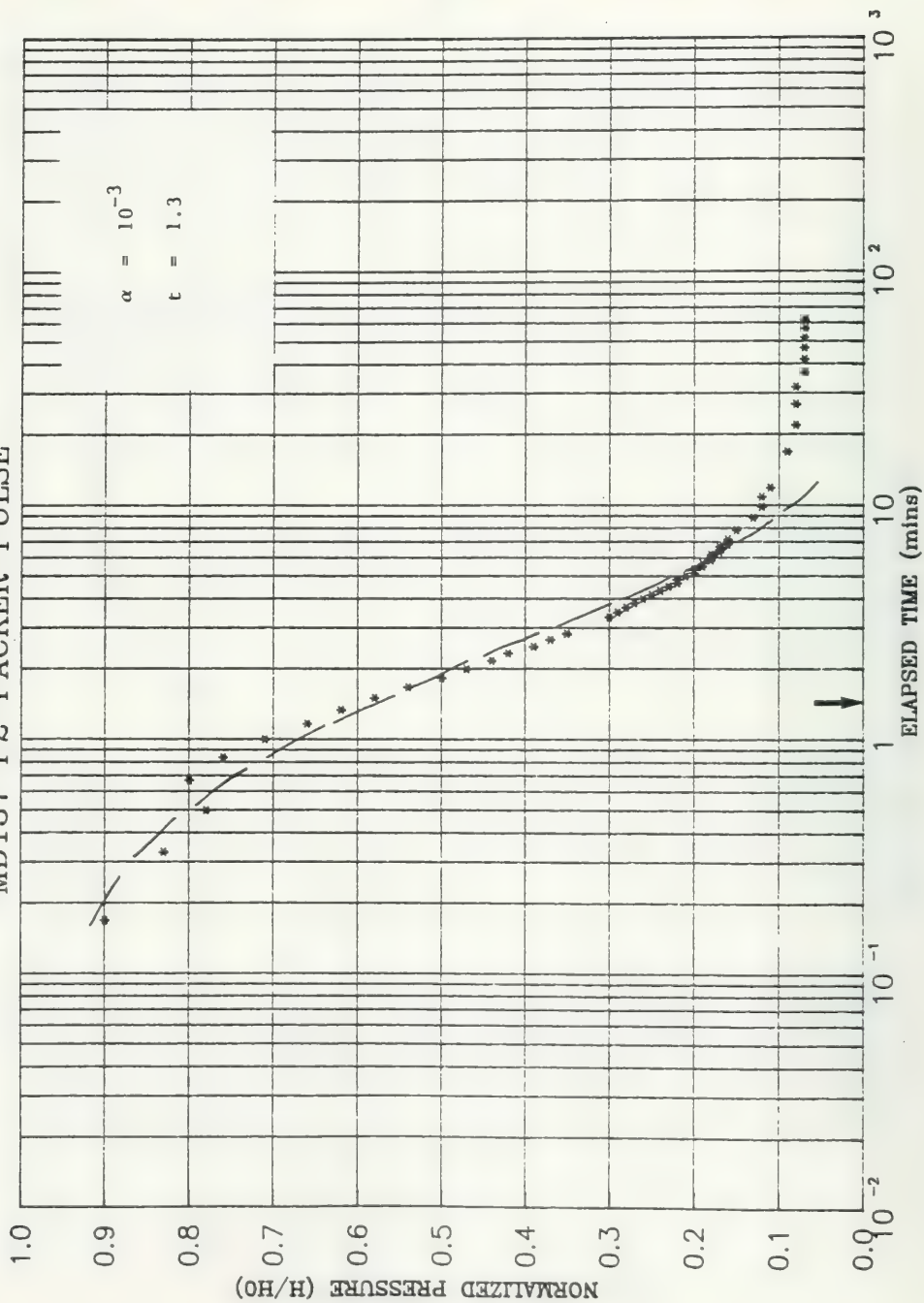


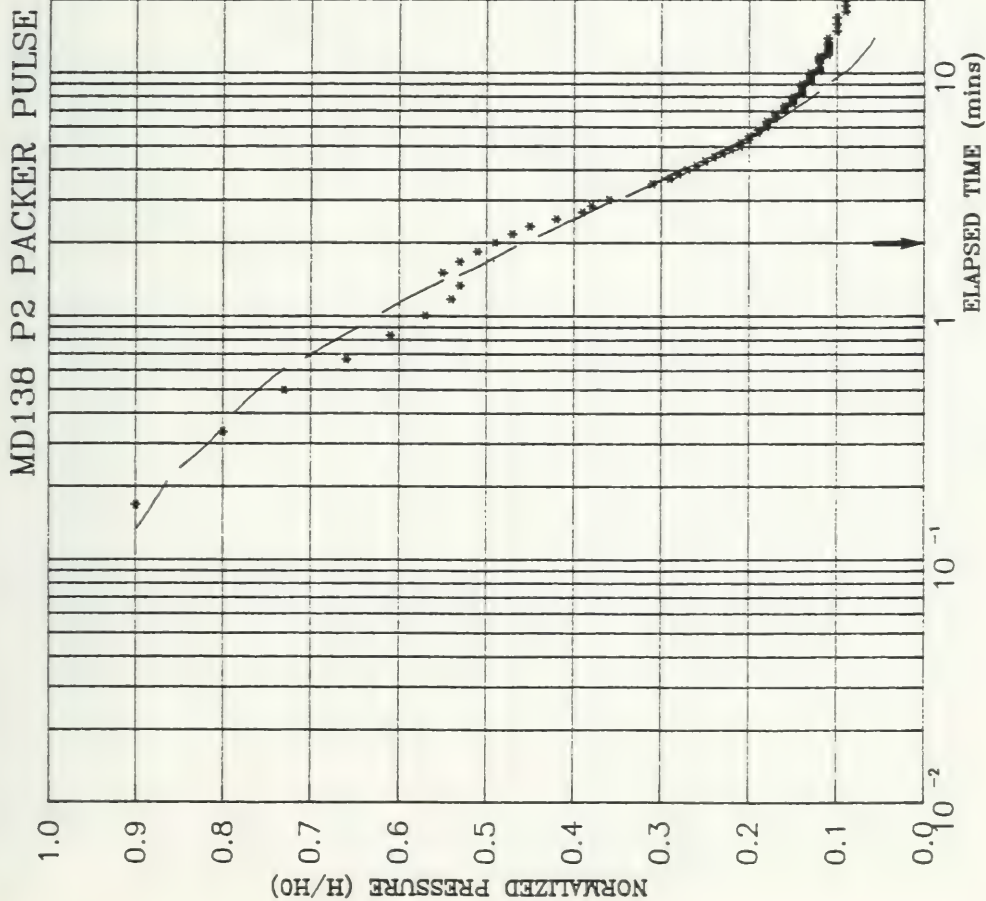
MD135 P2 PACKER PULSE



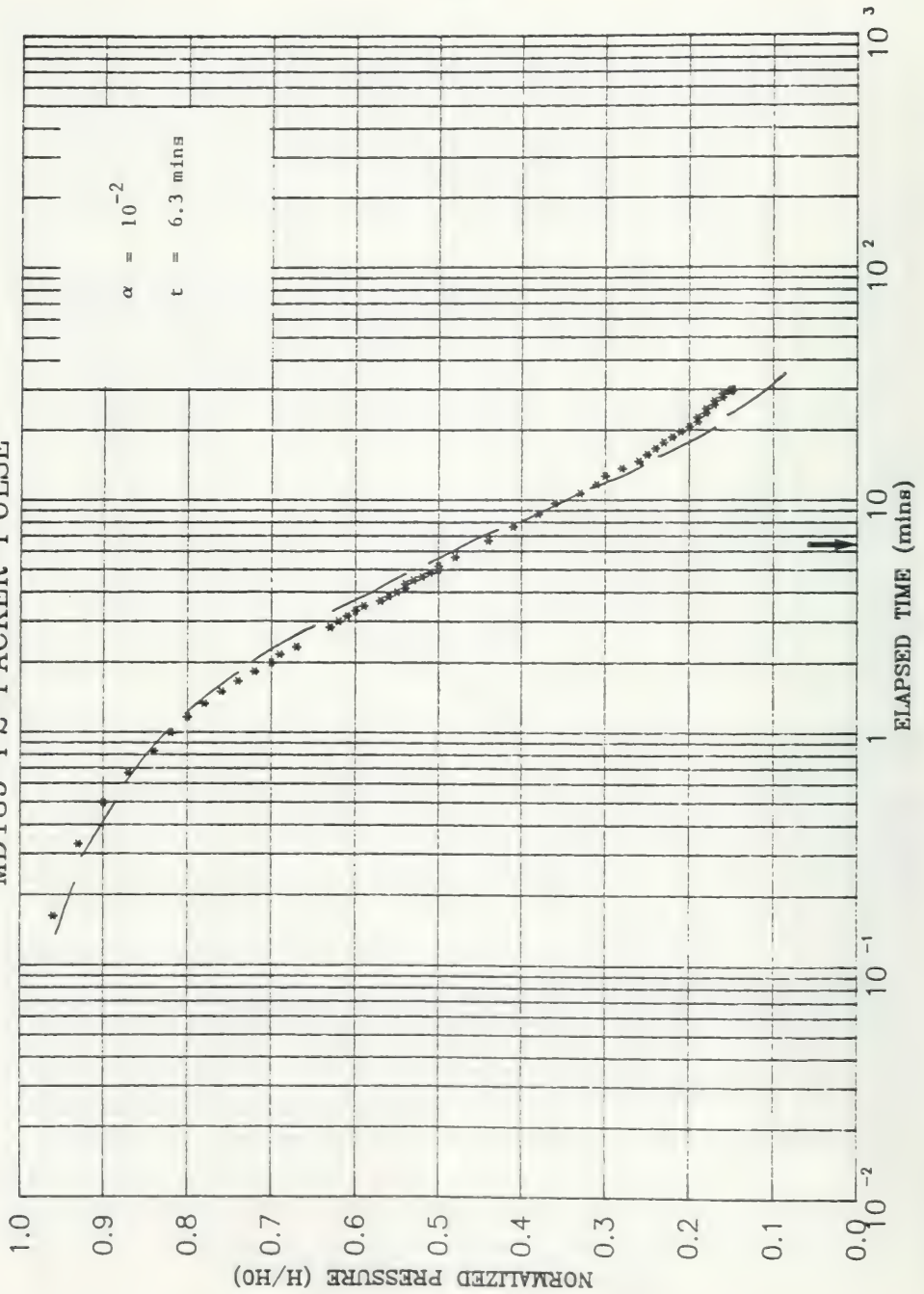


MD137 P2 PACKER PULSE





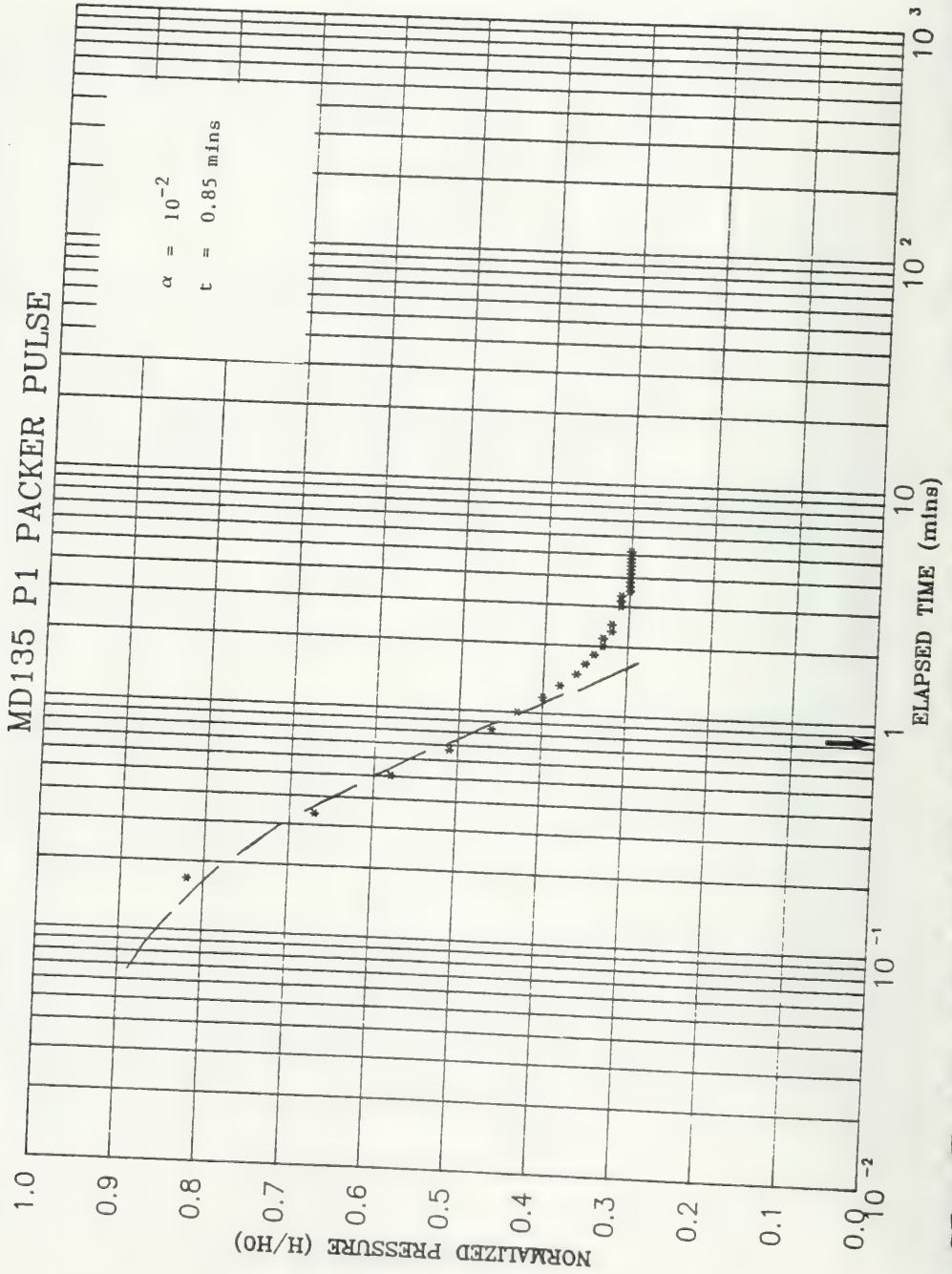
MD139 P2 PACKER PULSE



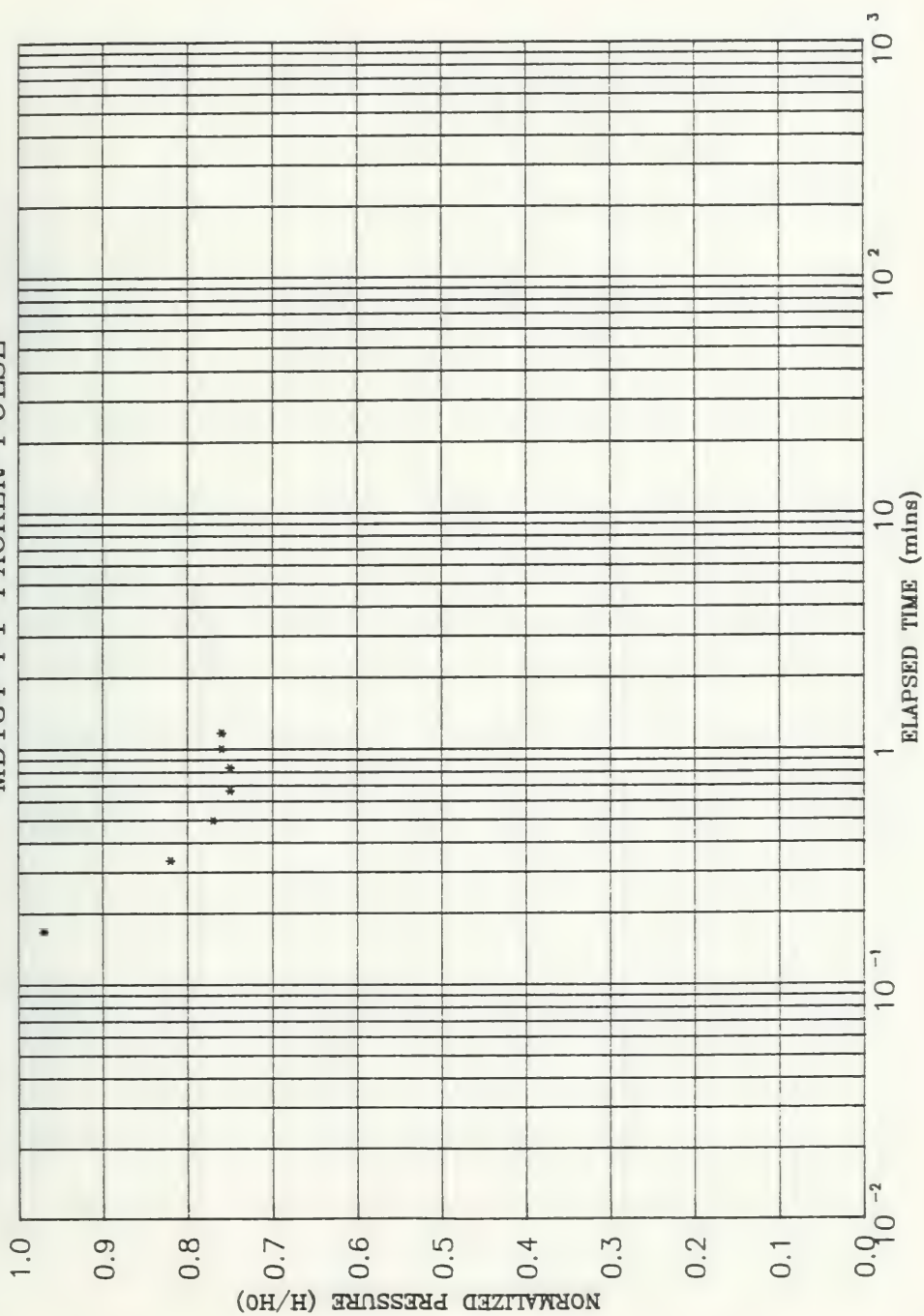
APPENDIX I4

Data Plots and Type Curve Analyses
(P1) (Below Probe) Packer Pulse Tests

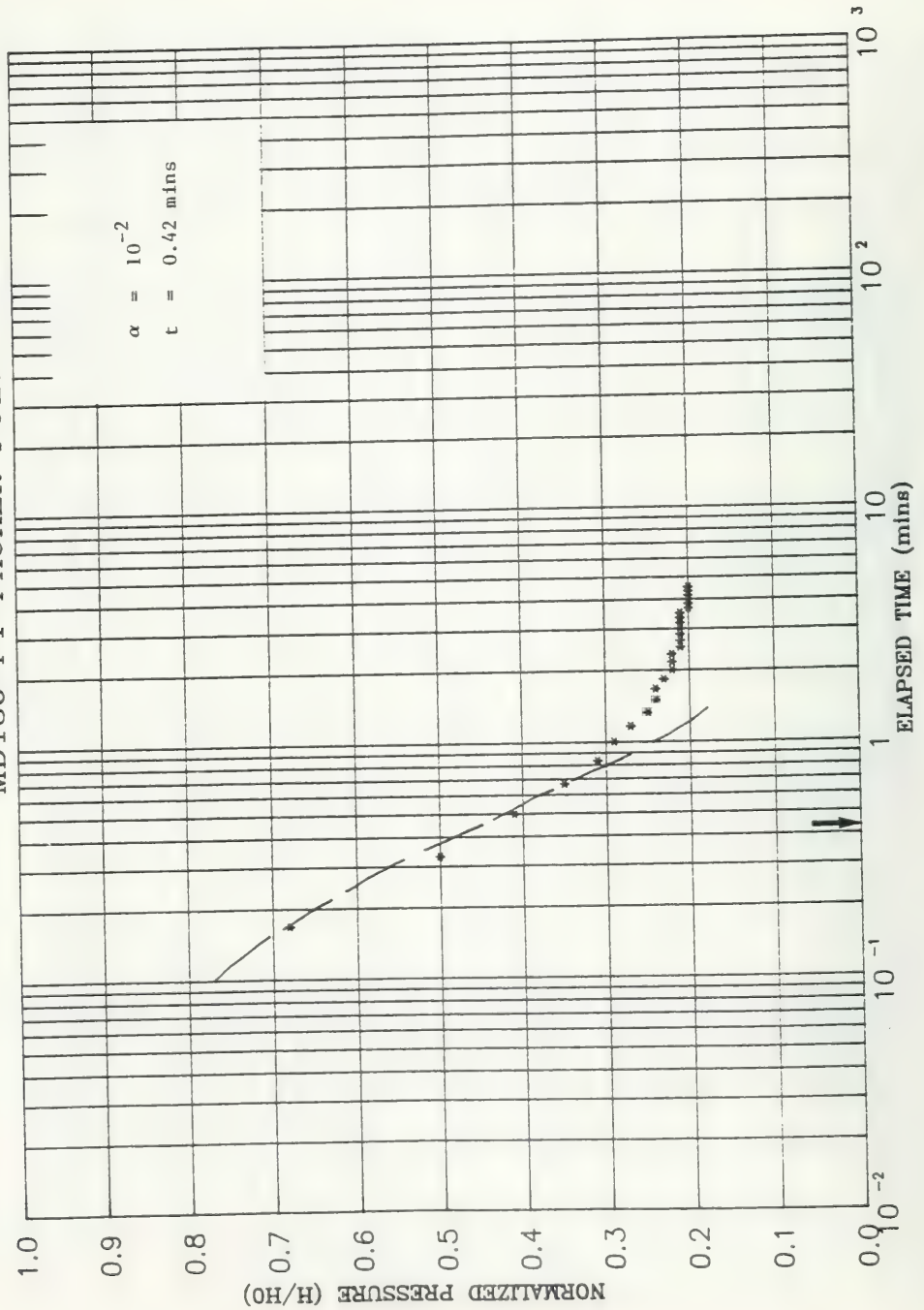
Borehole MDMW-1



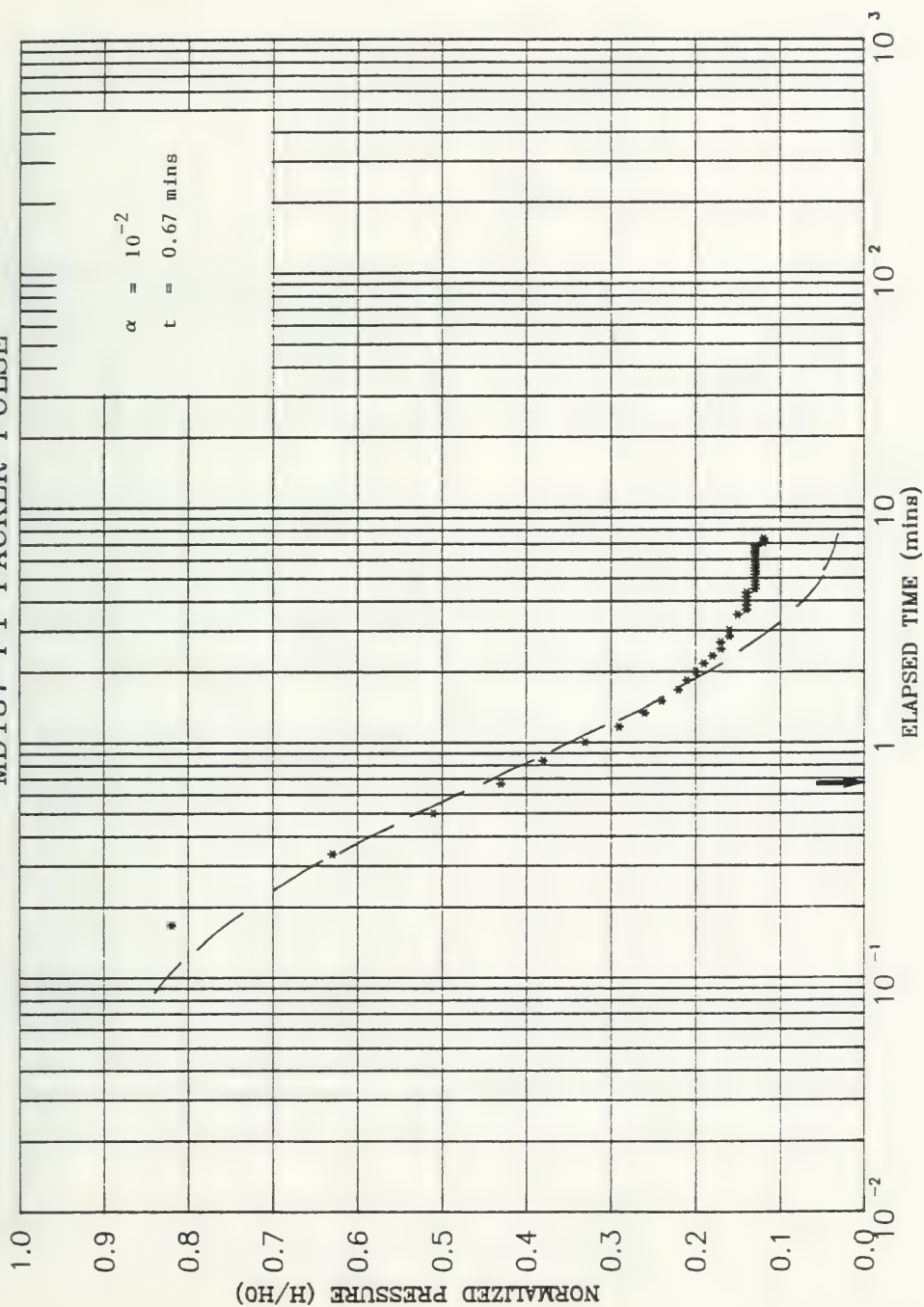
MD134 P1 PACKER PULSE



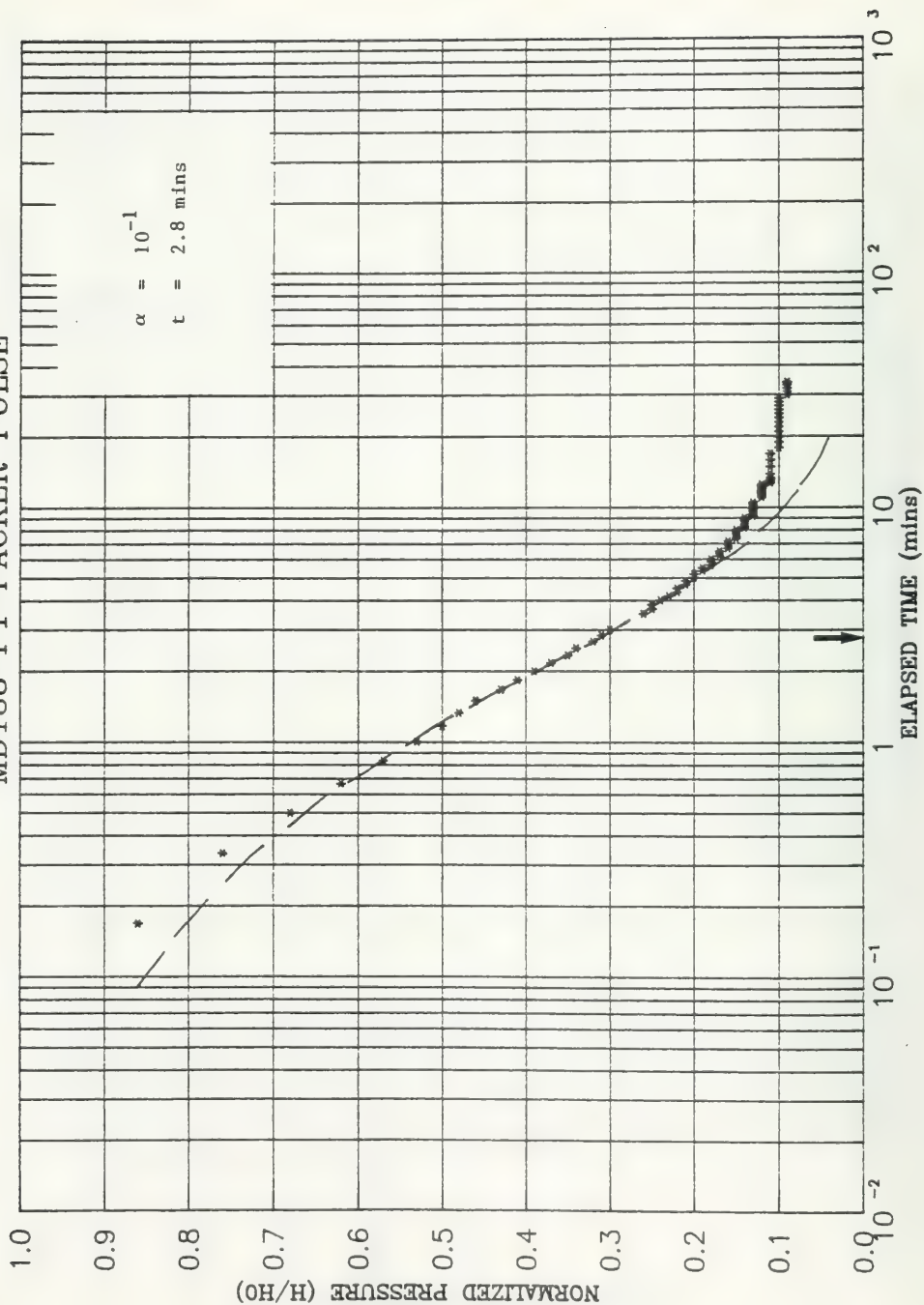
MD136 P1 PACKER PULSE



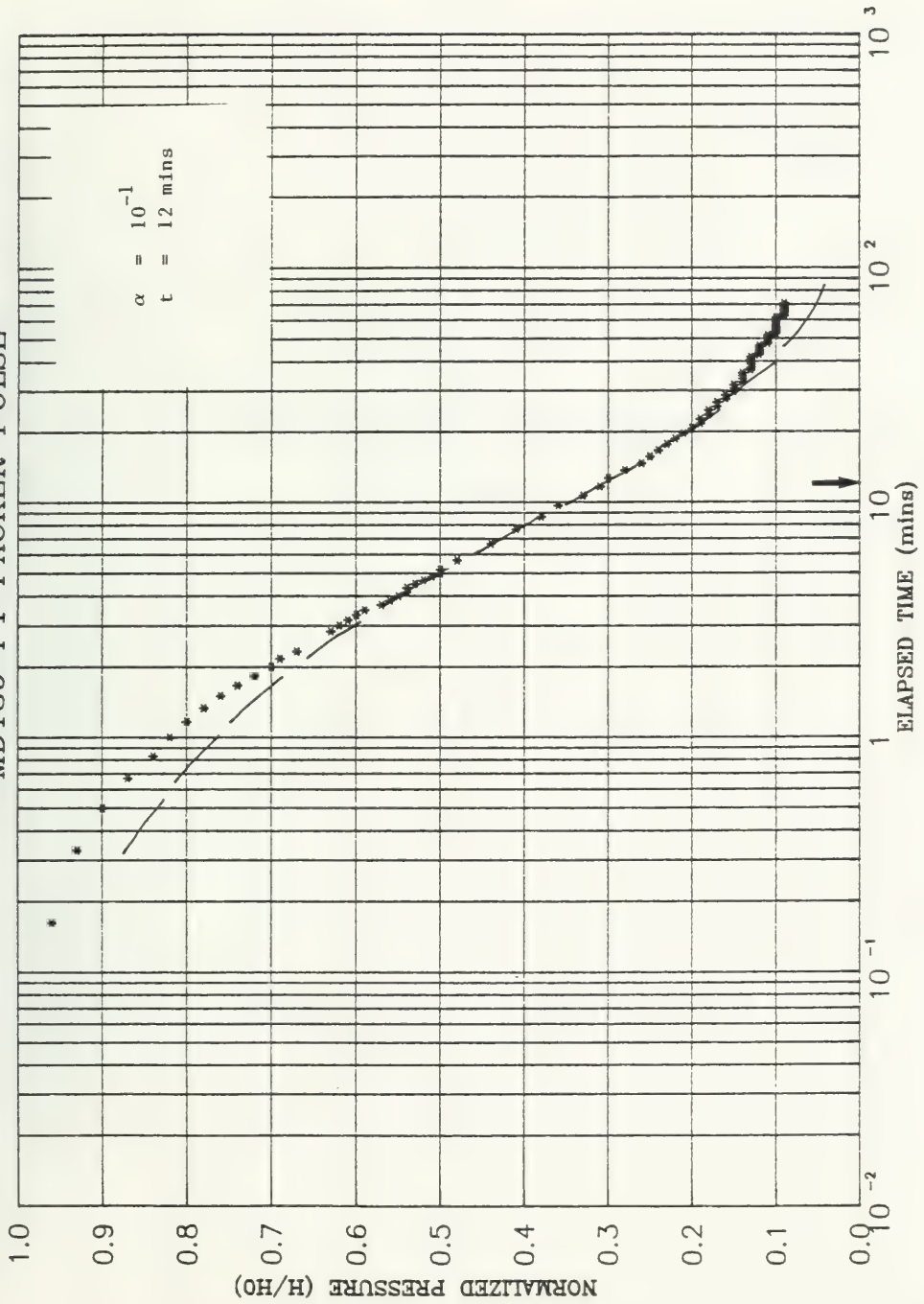
MD137 P1 PACKER PULSE



MD138 P1 PACKER PULSE



MD139 P1 PACKER PULSE



APPENDIX J

Pressure Profiles and Calculated
Equivalent Fresh Water Heads

Borehole MDMW-1

MOE - SARNIA

PRESSURE PROFILES FOR THE DEEP MONITORING WELL (MDMW-1)

| Port Depth (m) | Packer Interval m (BCT) | | | Survey Date October 25, 1987 | | | | Survey Date October 26, 1987 | | | |
|----------------------|-------------------------------|--------|----------|---------------------------------|------------------------------|--------------------------|--|---------------------------------|------------------------------|--------------------------|--|
| | Top | Bottom | Midpoint | Outside Casing (p.s.i.) | Inside Casing (p.s.i.) | Change in Pressure | Equivalent Fresh Water Head (mAMSLL) | Outside Casing (p.s.i.) | Inside Casing (p.s.i.) | Change in Pressure | Equivalent Fresh Water Head (mAMSLL) |
| 27.0 | 18.0 | 36.0 | 27.0 | 63.3 | 53.7 | 9.6 | 190.96 | 55.4 | 53.7 | 1.7 | 185.41 |
| 42.0 | 39.0 | 45.0 | 42.0 | 65.6 | 75.0 | -9.4 | 177.60 | 64.8 | 75.0 | -10.2 | 177.03 |
| 52.5 | 49.5 | 55.5 | 52.5 | 97.6 | 90.0 | 7.6 | 189.56 | 89.0 | 90.0 | -1.0 | 183.51 |
| 61.5 | 58.5 | 66.0 | 62.3 | 136.9 | 102.8 | 34.1 | 208.20 | 124.3 | 102.8 | 21.5 | 199.33 |
| 75.0 | 70.5 | 79.5 | 75.0 | 111.6 | 122.0 | -10.4 | 176.89 | 112.0 | 122.0 | -10.0 | 177.18 |
| 82.5 | 82.5 | 85.5 | 84.0 | 138.1 | 132.8 | 5.3 | 187.94 | 132.6 | 132.8 | -.2 | 184.07 |
| 91.5 | 88.5 | 97.5 | 93.0 | 160.2 | 145.6 | 14.6 | 194.48 | 149.8 | 145.6 | 4.2 | 187.16 |
| 103.5 | 100.5 | 106.5 | 103.5 | 178.2 | 162.6 | 15.6 | 195.18 | 165.8 | 162.6 | 3.2 | 186.46 |
| 111.0 | 109.5 | 114.0 | 111.8 | 191.0 | 173.3 | 17.7 | 196.66 | 177.6 | 173.3 | 4.3 | 187.23 |
| 123.0 | 117.0 | 126.0 | 121.5 | 204.7 | 190.4 | 14.3 | 194.27 | 191.3 | 190.4 | .9 | 184.84 |
| 132.0 | 129.0 | 135.0 | 132.0 | 225.5 | 203.1 | 22.4 | 199.97 | 217.2 | 203.1 | 14.1 | 194.13 |
| 141.0 | 138.0 | 144.0 | 141.0 | 240.9 | 216.0 | 24.9 | 201.73 | 243.6 | 216.0 | 27.6 | 203.63 |
| 153.0 | 148.5 | 156.0 | 152.3 | 251.8 | 233.1 | 18.7 | 197.37 | 250.6 | 233.1 | 17.5 | 196.52 |
| 162.0 | 159.0 | 165.0 | 162.0 | 264.9 | 246.0 | 18.9 | 197.51 | 262.3 | 246.0 | 16.3 | 195.68 |
| 174.0 | 168.0 | 177.0 | 172.5 | 256.5 | 263.0 | -6.5 | 179.64 | 256.3 | 263.0 | -6.7 | 179.50 |
| 180.0 | 180.0 | 183.0 | 181.5 | 258.4 | 271.5 | -13.1 | 174.99 | 258.3 | 271.5 | -13.2 | 174.92 |
| 186.0 | 186.0 | 196.5 | 191.3 | 264.0 | 280.0 | -16.0 | 172.95 | 263.8 | 280.0 | -16.2 | 172.81 |
| 192.0 | 186.0 | 196.5 | 191.3 | 273.2 | 288.8 | -15.6 | 173.24 | 273.1 | 288.8 | -15.7 | 173.17 |
| 201.0 | 201.0 | 211.5 | 206.3 | 285.8 | 301.7 | -15.9 | 173.02 | 285.7 | 301.7 | -16.0 | 172.95 |
| 207.0 | 201.0 | 211.5 | 206.3 | 295.7 | 310.2 | -14.5 | 174.01 | 295.6 | 310.2 | -14.6 | 173.94 |
| 219.0 | 216.0 | 222.0 | 219.0 | 317.3 | 327.4 | -10.1 | 177.10 | 317.1 | 327.4 | -10.3 | 176.96 |
| 228.0 | 225.0 | 231.0 | 228.0 | 337.8 | 340.3 | -2.5 | 182.45 | 337.8 | 340.3 | -2.5 | 182.45 |
| 240.0 | 234.0 | 243.0 | 238.5 | 358.1 | 357.4 | .7 | 184.70 | 358.1 | 357.4 | .7 | 184.70 |
| 249.0 | 246.0 | 252.0 | 249.0 | 378.5 | 370.1 | 8.4 | 190.12 | 378.8 | 370.1 | 8.7 | 190.33 |
| 258.0 | 255.0 | 261.0 | 258.0 | 393.2 | 382.8 | 10.4 | 191.53 | 393.4 | 382.8 | 10.6 | 191.67 |
| 262.5 | 262.5 | 262.5 | 262.5 | 401.5 | 389.3 | 12.2 | 192.79 | 401.2 | 389.3 | 11.9 | 192.58 |
| 271.5 | 265.5 | 274.5 | 270.0 | 414.7 | 402.1 | 12.6 | 193.07 | 414.9 | 402.1 | 12.8 | 193.21 |
| 280.5 | 277.5 | 286.5 | 282.0 | 428.1 | 414.9 | 13.2 | 193.50 | 428.5 | 414.9 | 13.6 | 193.78 |
| 291.0 | 291.0 | 300.0 | 295.5 | 442.3 | 429.8 | 12.5 | 193.00 | 443.0 | 429.8 | 13.2 | 193.50 |
| 297.0 | 291.0 | 300.0 | 295.5 | 452.8 | 438.2 | 14.6 | 194.48 | 454.1 | 438.2 | 15.9 | 195.40 |

Note: All "inside casing" values are from the October 25, 1987 survey.

MOE - SARNIA

PRESSURE PROFILES FOR THE DEEP MONITORING WELL (MOMW-1)

| Port Depth (m) | Packer Interval m (BCT) | | | Survey Date October 28, 1987 | | | | Survey Date November 6, 1987 | | | |
|----------------------|-------------------------------|--------|----------|---------------------------------|------------------------------|--------------------------|--|---------------------------------|------------------------------|--------------------------|--|
| | | | | Outside Casing (p.s.i.) | Inside Casing (p.s.i.) | Change in Pressure | Equivalent Fresh Water Head (mAMS) | Outside Casing (p.s.i.) | Inside Casing (p.s.i.) | Change in Pressure | Equivalent Fresh Water Head (mAMS) |
| | Top | Bottom | Midpoint | | | | | | | | |
| 27.0 | 18.0 | 36.0 | 27.0 | 52.4 | 53.7 | -1.3 | 183.30 | 51.6 | 53.7 | -2.1 | 182.73 |
| 42.0 | 39.0 | 45.0 | 42.0 | 64.5 | 75.0 | -10.5 | 176.82 | 65.5 | 75.0 | -9.5 | 177.53 |
| 52.5 | 49.5 | 55.5 | 52.5 | 84.0 | 90.0 | -6.0 | 179.99 | 80.6 | 90.0 | -9.4 | 177.60 |
| 61.5 | 58.5 | 66.0 | 62.3 | 117.2 | 102.8 | 14.4 | 194.34 | 128.9 | 102.8 | 26.1 | 202.57 |
| 75.0 | 70.5 | 79.5 | 75.0 | 113.2 | 122.0 | -8.8 | 178.02 | 115.8 | 122.0 | -6.2 | 179.85 |
| 82.5 | 82.5 | 85.5 | 84.0 | 130.0 | 132.8 | -2.8 | 182.24 | 124.4 | 132.8 | -8.4 | 178.30 |
| 91.5 | 88.5 | 97.5 | 93.0 | 144.1 | 145.6 | -1.5 | 183.15 | 133.7 | 145.6 | -11.9 | 175.84 |
| 103.5 | 100.5 | 106.5 | 103.5 | 159.8 | 162.6 | -2.8 | 182.24 | 152.0 | 162.6 | -10.6 | 176.75 |
| 111.0 | 109.5 | 114.0 | 111.8 | 171.5 | 173.3 | -1.8 | 182.94 | 171.5 | 173.3 | -1.8 | 182.94 |
| 123.0 | 117.0 | 126.0 | 121.5 | 188.1 | 190.4 | -2.3 | 182.59 | 208.5 | 190.4 | 18.1 | 196.94 |
| 132.0 | 129.0 | 135.0 | 132.0 | 214.2 | 203.1 | 11.1 | 192.02 | 231.7 | 203.1 | 28.6 | 204.33 |
| 141.0 | 138.0 | 144.0 | 141.0 | 246.3 | 216.0 | 30.3 | 205.53 | 250.3 | 216.0 | 34.3 | 208.34 |
| 153.0 | 148.5 | 156.0 | 152.3 | 250.6 | 233.1 | 17.5 | 196.52 | 252.9 | 233.1 | 19.8 | 198.14 |
| 162.0 | 159.0 | 165.0 | 162.0 | 260.2 | 246.0 | 14.2 | 194.20 | 259.1 | 246.0 | 13.1 | 193.43 |
| 174.0 | 168.0 | 177.0 | 172.5 | 256.2 | 263.0 | -6.8 | 179.43 | 255.8 | 263.0 | -7.2 | 179.14 |
| 180.0 | 180.0 | 183.0 | 181.5 | 257.6 | 271.5 | -13.9 | 174.43 | 257.8 | 271.5 | -13.7 | 174.57 |
| 186.0 | 186.0 | 196.5 | 191.3 | 263.6 | 280.0 | -16.4 | 172.67 | 263.7 | 280.0 | -16.3 | 172.74 |
| 192.0 | 186.0 | 196.5 | 191.3 | 273.0 | 288.8 | -15.8 | 173.09 | 273.0 | 288.8 | -15.8 | 173.09 |
| 201.0 | 201.0 | 211.5 | 206.3 | 285.7 | 301.7 | -16.0 | 172.95 | 285.5 | 301.7 | -16.2 | 172.81 |
| 207.0 | 201.0 | 211.5 | 206.3 | 295.7 | 310.2 | -14.5 | 174.01 | 295.4 | 310.2 | -14.8 | 173.80 |
| 219.0 | 216.0 | 222.0 | 219.0 | 317.0 | 327.4 | -10.4 | 176.89 | 316.5 | 327.4 | -10.9 | 176.54 |
| 228.0 | 225.0 | 231.0 | 228.0 | 338.0 | 340.3 | -2.3 | 182.59 | 338.0 | 340.3 | -2.3 | 182.59 |
| 240.0 | 234.0 | 243.0 | 238.5 | 358.3 | 357.4 | .9 | 184.84 | 358.4 | 357.4 | 1.0 | 184.91 |
| 249.0 | 246.0 | 252.0 | 249.0 | 379.2 | 370.1 | 9.1 | 190.61 | 379.7 | 370.1 | 9.6 | 190.96 |
| 258.0 | 255.0 | 261.0 | 258.0 | 393.8 | 382.8 | 11.0 | 191.95 | 394.3 | 382.8 | 11.5 | 192.30 |
| 262.5 | 262.5 | 262.5 | 262.5 | 400.9 | 389.3 | 11.6 | 192.37 | 473.1 | 389.3 | 83.8 | 243.16 |
| 271.5 | 265.5 | 274.5 | 270.0 | 415.3 | 402.1 | 13.2 | 193.50 | 415.8 | 402.1 | 13.7 | 193.85 |
| 280.5 | 277.5 | 286.5 | 282.0 | 429.0 | 414.9 | 14.1 | 194.13 | 429.9 | 414.9 | 15.0 | 194.76 |
| 291.0 | 291.0 | 300.0 | 295.5 | 445.0 | 429.8 | 15.2 | 194.90 | 442.1 | 429.8 | 12.3 | 192.86 |
| 297.0 | 291.0 | 300.0 | 295.5 | 455.7 | 438.2 | 17.5 | 196.52 | 455.3 | 438.2 | 17.1 | 196.24 |

Note: All "inside casing" values are from the October 25, 1987 survey.

MOE - SARNIA

PRESSURE PROFILES FOR THE DEEP MONITORING WELL (MDMW-1)

| Port Depth (m) | Packer Interval m (BCT) | | | Survey Date November 30, 1987 | | | | Survey Date February 2, 1988 | | | |
|----------------------|-------------------------------|--------|----------|----------------------------------|------------------------------|--------------------------|---|---------------------------------|------------------------------|--------------------------|---|
| | Top | Bottom | Midpoint | Outside Casing (p.s.i.) | Inside Casing (p.s.i.) | Change in Pressure | Equivalent Fresh Water Head (mAMSL) | Outside Casing (p.s.i.) | Inside Casing (p.s.i.) | Change in Pressure | Equivalent Fresh Water Head (mAMSL) |
| 27.0 | 18.0 | 36.0 | 27.0 | 52.4 | 53.7 | -1.3 | 183.30 | 52.4 | 53.7 | -1.3 | 183.30 |
| 42.0 | 39.0 | 45.0 | 42.0 | 66.9 | 75.0 | -8.1 | 178.51 | 68.4 | 75.0 | -6.6 | 179.57 |
| 52.5 | 49.5 | 55.5 | 52.5 | 88.2 | 90.0 | -1.8 | 182.94 | 98.3 | 90.0 | 8.3 | 190.05 |
| 61.5 | 58.5 | 66.0 | 62.3 | 125.6 | 102.8 | 22.8 | 200.25 | 126.1 | 102.8 | 23.3 | 200.60 |
| 75.0 | 70.5 | 79.5 | 75.0 | 119.3 | 122.0 | -2.7 | 182.31 | 124.2 | 122.0 | 2.2 | 185.76 |
| 82.5 | 82.5 | 85.5 | 84.0 | 120.9 | 132.8 | -11.9 | 175.84 | 138.9 | 132.8 | 6.1 | 188.50 |
| 91.5 | 88.5 | 97.5 | 93.0 | 127.7 | 145.6 | -17.9 | 171.62 | 185.8 | 145.6 | 40.2 | 212.49 |
| 103.5 | 100.5 | 106.5 | 103.5 | 145.0 | 162.6 | -17.6 | 171.83 | 210.7 | 162.6 | 48.1 | 218.05 |
| 111.0 | 109.5 | 114.0 | 111.8 | 168.5 | 173.3 | -4.8 | 180.83 | 233.2 | 173.3 | 59.9 | 226.35 |
| 123.0 | 117.0 | 126.0 | 121.5 | 234.5 | 190.4 | 44.1 | 215.23 | 263.8 | 190.4 | 73.4 | 235.85 |
| 132.0 | 129.0 | 135.0 | 132.0 | 238.8 | 203.1 | 35.7 | 209.32 | 253.1 | 203.1 | 50.0 | 219.38 |
| 141.0 | 138.0 | 144.0 | 141.0 | 252.1 | 216.0 | 36.1 | 209.61 | 252.5 | 216.0 | 36.5 | 209.89 |
| 153.0 | 148.5 | 156.0 | 152.3 | 257.4 | 233.1 | 24.3 | 201.30 | 259.4 | 233.1 | 26.3 | 202.71 |
| 162.0 | 159.0 | 165.0 | 162.0 | 259.1 | 246.0 | 13.1 | 193.43 | 258.3 | 246.0 | 12.3 | 192.86 |
| 174.0 | 168.0 | 177.0 | 172.5 | 254.4 | 263.0 | -8.6 | 178.16 | - | 263.0 | - | - |
| 180.0 | 180.0 | 183.0 | 181.5 | 257.1 | 271.5 | -14.4 | 174.08 | 257.1 | 271.5 | -14.4 | 174.08 |
| 186.0 | 186.0 | 196.5 | 191.3 | 264.1 | 280.0 | -15.9 | 173.02 | 265.7 | 280.0 | -14.3 | 174.15 |
| 192.0 | 186.0 | 196.5 | 191.3 | 273.1 | 288.8 | -15.7 | 173.17 | 273.0 | 288.8 | -15.8 | 173.09 |
| 201.0 | 201.0 | 211.5 | 206.3 | 285.4 | 301.7 | -16.3 | 172.74 | 285.7 | 301.7 | -16.0 | 172.95 |
| 207.0 | 201.0 | 211.5 | 206.3 | 295.1 | 310.2 | -15.1 | 173.59 | 295.0 | 310.2 | -15.2 | 173.52 |
| 219.0 | 216.0 | 222.0 | 219.0 | 316.0 | 327.4 | -11.4 | 176.19 | 315.0 | 327.4 | -12.4 | 175.49 |
| 228.0 | 225.0 | 231.0 | 228.0 | 338.5 | 340.3 | -1.8 | 182.94 | 337.9 | 340.3 | -2.4 | 182.52 |
| 240.0 | 234.0 | 243.0 | 238.5 | 359.0 | 357.4 | 1.6 | 185.34 | 359.6 | 357.4 | 2.2 | 185.76 |
| 249.0 | 246.0 | 252.0 | 249.0 | 379.9 | 370.1 | 9.8 | 191.10 | 380.2 | 370.1 | 10.1 | 191.32 |
| 258.0 | 255.0 | 261.0 | 258.0 | 394.3 | 382.8 | 11.5 | 192.30 | 394.5 | 382.8 | 11.7 | 192.44 |
| 262.5 | 262.5 | 262.5 | 262.5 | 401.2 | 389.3 | 11.9 | 192.58 | 401.4 | 389.3 | 12.1 | 192.72 |
| 271.5 | 265.5 | 274.5 | 270.0 | 415.9 | 402.1 | 13.8 | 193.92 | 416.1 | 402.1 | 14.0 | 194.06 |
| 280.5 | 277.5 | 286.5 | 282.0 | 429.9 | 414.9 | 15.0 | 194.76 | 430.2 | 414.9 | 15.3 | 194.97 |
| 291.0 | 291.0 | 300.0 | 295.5 | 441.8 | 429.8 | 12.0 | 192.65 | 445.7 | 429.8 | 15.9 | 195.40 |
| 297.0 | 291.0 | 300.0 | 295.5 | 456.3 | 438.2 | 18.1 | 196.94 | 456.2 | 438.2 | 18.0 | 196.87 |

Note: All "inside casing" values are from the October 25, 1987 survey.

MOE - SARNIA

PRESSURE PROFILES FOR THE DEEP MONITORING WELL (MDMW-1)

| Port Depth (m) | Packer Interval m (BCT) | | | Survey Date March 26, 1988 | | | | Survey Date May 30, 1988 | | | |
|----------------------|-------------------------------|--------|----------|-------------------------------|------------------------------|--------------------------|--|-------------------------------|------------------------------|--------------------------|--|
| | | | | Outside Casing (p.s.i.) | Inside Casing (p.s.i.) | Change in Pressure | Equivalent Fresh Water Head (mAMSLL) | Outside Casing (p.s.i.) | Inside Casing (p.s.i.) | Change in Pressure | Equivalent Fresh Water Head (mAMSLL) |
| | Top | Bottom | Midpoint | | | | | | | | |
| 27.0 | 18.0 | 36.0 | 27.0 | 51.7 | 53.7 | -2.0 | 182.80 | 52.3 | 53.7 | -1.4 | 183.23 |
| 42.0 | 39.0 | 45.0 | 42.0 | 68.9 | 75.0 | -6.1 | 179.92 | 69.5 | 75.0 | -5.5 | 180.34 |
| 52.5 | 49.5 | 55.5 | 52.5 | 103.3 | 90.0 | 13.3 | 193.57 | 104.1 | 90.0 | 14.1 | 194.13 |
| 61.5 | 58.5 | 66.0 | 62.3 | 125.9 | 102.8 | 23.1 | 200.46 | 125.6 | 102.8 | 22.8 | 200.25 |
| 75.0 | 70.5 | 79.5 | 75.0 | 126.3 | 122.0 | 4.3 | 187.23 | 127.6 | 122.0 | 5.6 | 188.15 |
| 82.5 | 82.5 | 85.5 | 84.0 | 161.6 | 132.8 | 28.8 | 204.47 | 163.0 | 132.8 | 30.2 | 205.46 |
| 91.5 | 88.5 | 97.5 | 93.0 | 205.2 | 145.6 | 59.6 | 226.14 | 210.5 | 145.6 | 64.9 | 229.87 |
| 103.5 | 100.5 | 106.5 | 103.5 | 226.9 | 162.6 | 64.3 | 229.44 | 233.9 | 162.6 | 71.3 | 234.37 |
| 111.0 | 109.5 | 114.0 | 111.8 | 248.2 | 173.3 | 74.9 | 236.90 | 256.2 | 173.3 | 82.9 | 242.53 |
| 123.0 | 117.0 | 126.0 | 121.5 | 276.1 | 190.4 | 85.7 | 244.50 | 282.6 | 190.4 | 92.2 | 249.07 |
| 132.0 | 129.0 | 135.0 | 132.0 | 263.7 | 203.1 | 60.6 | 226.84 | 266.8 | 203.1 | 63.7 | 229.02 |
| 141.0 | 138.0 | 144.0 | 141.0 | 250.9 | 216.0 | 34.9 | 208.76 | 253.9 | 216.0 | 37.9 | 210.87 |
| 153.0 | 148.5 | 156.0 | 152.3 | 257.1 | 233.1 | 24.0 | 201.09 | 256.9 | 233.1 | 23.8 | 200.95 |
| 162.0 | 159.0 | 165.0 | 162.0 | 256.4 | 246.0 | 10.4 | 191.53 | 255.5 | 246.0 | 9.5 | 190.89 |
| 174.0 | 168.0 | 177.0 | 172.5 | 255.4 | 263.0 | -7.6 | 178.86 | 256.6 | 263.0 | -6.4 | 179.71 |
| 180.0 | 180.0 | 183.0 | 181.5 | 259.7 | 271.5 | -11.8 | 175.91 | 259.1 | 271.5 | -12.4 | 175.49 |
| 186.0 | 186.0 | 196.5 | 191.3 | 266.4 | 280.0 | -13.6 | 174.64 | 264.2 | 280.0 | -15.8 | 173.09 |
| 192.0 | 186.0 | 196.5 | 191.3 | 273.5 | 288.8 | -15.3 | 173.45 | 272.4 | 288.8 | -16.4 | 172.67 |
| 201.0 | 201.0 | 211.5 | 206.3 | 286.4 | 301.7 | -15.3 | 173.45 | 285.9 | 301.7 | -15.8 | 173.09 |
| 207.0 | 201.0 | 211.5 | 206.3 | 295.6 | 310.2 | -14.6 | 173.94 | 294.9 | 310.2 | -15.3 | 173.45 |
| 219.0 | 216.0 | 222.0 | 219.0 | 315.3 | 327.4 | -12.1 | 175.70 | 315.6 | 327.4 | -11.8 | 175.91 |
| 228.0 | 225.0 | 231.0 | 228.0 | 338.2 | 340.3 | -2.1 | 182.73 | 337.2 | 340.3 | -3.1 | 182.03 |
| 240.0 | 234.0 | 243.0 | 238.5 | 359.1 | 357.4 | 1.7 | 185.41 | 359.0 | 357.4 | 1.6 | 185.34 |
| 249.0 | 246.0 | 252.0 | 249.0 | 380.9 | 370.1 | 10.8 | 191.81 | 380.2 | 370.1 | 10.1 | 191.32 |
| 258.0 | 255.0 | 261.0 | 258.0 | - | 382.8 | - | - | - | 382.8 | - | - |
| 262.5 | 262.5 | 262.5 | 262.5 | - | 389.3 | - | - | - | 389.3 | - | - |
| 271.5 | 265.5 | 274.5 | 270.0 | - | 402.1 | - | - | - | 402.1 | - | - |
| 280.5 | 277.5 | 286.5 | 282.0 | - | 414.9 | - | - | - | 414.9 | - | - |
| 291.0 | 291.0 | 300.0 | 295.5 | - | 429.8 | - | - | - | 429.8 | - | - |
| 297.0 | 291.0 | 300.0 | 295.5 | - | 438.2 | - | - | - | 438.2 | - | - |

Note: All "inside casing" values are from the October 25, 1987 survey.

APPENDIX K

Groundwater Chemistry

Borehole MDMW-1

INDEX FOR QA/QC SAMPLES

BOREHOLE MDMW-1

| Sample Identification | Sample Description |
|-----------------------|---|
| Westbay | Distilled water rinse of 3 m section Westbay PVC well casing |
| MDMW-1-R1 | Distilled water rinse through stainless sample cylinder and filter unit - First Sampling Round |
| MDMW-1-R2 | Distilled water rinse through stainless sample cylinder and filter unit - Second Sampling Round |
| MDMW-1-R3 | Distilled water rinse through stainless sample cylinder and filter unit - Third Sampling Round |
| MDMW-1-R4 | Distilled water rinse through stainless sample cylinder and filter unit - Fourth Sampling Round |

APPENDIX K1

Borehole MDMW-1
Major Ions, Metals and Selected Phenols

Analyses by:

Ontario Ministry of the Environment
Rexdale, Ontario

and

Zenon Environmental Inc.
Burlington, Ontario

Deep Monitoring Well (MDMW-1)

| Parameter (mg/l) | 2nd Round 61.5 m | 3rd Round 61.5 m | 4th Round 61.5 m | 1st Round 75 m | 2nd Round 75 m | 2nd Round Duplicate 75 m | 3rd Round 75 m | 4th Round 75 m |
|------------------------------------|------------------------|------------------------|------------------------|----------------------|----------------------|-----------------------------------|----------------------|----------------------|
| Fluoride | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Chloride | 28000 | 26000 | 21000 | 30000 | 34000 | 35000 | 36000 | 32000 |
| Nitrite (as N) | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 |
| Bromide | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 |
| Nitrate (as N) | 19 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 |
| Phosphate (as P) | < 8.0 | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 |
| Sulfate | 1000 | 1100 | 1200 | 1200 | 1800 | 1600 | 1500 | 1800 |
| Alkalinity (as CaCO ₃) | 130 | 130 | 130 | 130 | 150 | 140 | 130 | 130 |
| Calcium | 1400 | 1400 | 1500 | 2200 | 2000 | 2000 | 2000 | 2100 |
| Magnesium | 590 | 580 | 660 | 960 | 820 | 800 | 800 | 890 |
| Sodium | 10000 | 11000 | 12000 | 15000 | 15000 | 14000 | 15000 | 15000 |
| Potassium | 78 | 69 | 78 | 120 | 110 | 110 | 100 | 100 |
| Aluminum | < 0.5 | 0.35 | 3.2 | 0.13 | 0.12 | 0.070 | 0.83 | 2.4 |
| Barium | 0.25 | 0.21 | 0.27 | 0.30 | 0.21 | 0.20 | 0.21 | 0.23 |
| Beryllium | < 0.01 | 0.03 | < 0.02 | < 0.001 | < 0.001 | < 0.001 | 0.02 | < 0.01 |
| Boron | 5.4 | 6.4 | 12 | 6.0 | 5.3 | 5.1 | 7.2 | 12 |
| Cadmium | < 0.05 | < 0.05 | < 0.05 | < 0.005 | < 0.005 | < 0.005 | < 0.05 | < 0.05 |
| Chromium | < 0.1 | < 0.1 | < 0.1 | 0.019 | 0.014 | 0.012 | < 0.1 | < 0.1 |
| Cobalt | < 0.1 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Copper | < 0.1 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Iron | < 0.1 | 0.12 | 0.50 | 0.23 | 0.073 | 0.062 | < 0.1 | < 0.1 |
| Lead | < 0.4 | < 0.4 | < 0.4 | < 0.04 | < 0.04 | < 0.04 | < 0.4 | < 0.4 |
| Manganese | 0.31 | 0.23 | 0.23 | 0.26 | 0.21 | 0.20 | 0.27 | 0.17 |
| Molybdenum | < 0.1 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Nickel | 0.40 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Phosphorous | 60 | 13 | 10 | < 0.1 | 12 | 11 | 10.0 | < 2 |
| Silicon | 2.0 | 2.8 | 4.1 | 2.2 | 2.8 | 2.7 | 2.8 | 3.0 |
| Silver | < 0.1 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Strontium | 35 | 34 | 37 | 42 | 51 | 50 | 50.0 | 52 |
| Sulfur | — | 430 | 400 | — | — | — | 630 | 730 |
| Thallium | < 0.5 | < 0.5 | < 0.5 | < 0.05 | < 0.05 | < 0.5 | < 0.5 | < 0.5 |
| Titanium | < 0.1 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Vanadium | < 0.1 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Zinc | < 0.1 | < 0.1 | < 0.1 | < 0.01 | 0.011 | 0.014 | < 0.1 | < 0.1 |
| Zirconium | < 0.1 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |

| Parameter (mg/l) | Deep Monitoring Well (MDMW-1) | | | | | | | |
|------------------------------------|-------------------------------|-----------------------|-----------------------|------------------------------------|-----------------------|------------------------------------|-----------------------|--|
| | 1st Round 123 m | 2nd Round 123 m | 3rd Round 123 m | 3rd Round Duplicate 123 m | 4th Round 123 m | 4th Round Duplicate 123 m | 1st Round 180 m | |
| Fluoride | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | |
| Chloride | 31000 | 40000 | 38000 | 38000 | 39000 | 32000 | 36000 | |
| Nitrite (as N) | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | |
| Bromide | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | |
| Nitrate (as N) | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | |
| Phosphate (as P) | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | |
| Sulfate | 1600 | 2000 | 680 | 1800 | 2300 | 2200 | 1900 | |
| Alkalinity (as CaCO ₃) | 150 | 250 | 190 | 200 | 180 | 180 | 170 | |
| Calcium | 3100 | 2800 | 2700 | 2700 | 3000 | 2900 | 3400 | |
| Magnesium | 1200 | 1000 | 1100 | 1100 | 1300 | 1200 | 1300 | |
| Sodium | 15000 | 15000 | 15000 | 15000 | 17000 | 17000 | 15000 | |
| Potassium | 110 | 140 | 130 | 130 | 140 | 140 | 180 | |
| Aluminum | 0.12 | 0.22 | 0.78 | 2.3 | 3.2 | 2.9 | 0.25 | |
| Barium | 0.30 | 0.29 | 0.34 | 0.35 | 0.35 | 0.34 | 0.28 | |
| Beryllium | < 0.001 | < 0.001 | < 0.01 | < 0.01 | < 0.02 | < 0.02 | < 0.001 | |
| Boron | 8.8 | 8.1 | 11 | 13 | 17 | 18 | 11 | |
| Cadmium | < 0.005 | < 0.005 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.005 | |
| Chromium | 0.020 | 0.015 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 0.10 | |
| Cobalt | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.01 | |
| Copper | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.01 | |
| Iron | 0.38 | 0.15 | < 0.1 | < 0.1 | 0.56 | 0.37 | 0.11 | |
| Lead | < 0.04 | < 0.04 | < 0.4 | < 0.4 | < 0.4 | < 0.4 | < 0.04 | |
| Manganese | 0.35 | 0.59 | 0.46 | 0.47 | 0.59 | 0.55 | 0.35 | |
| Molybdenum | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.01 | |
| Nickel | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.01 | |
| Phosphorous | < 0.1 | 13 | 11 | 11 | 11 | 9.0 | < 0.1 | |
| Silicon | 2.2 | 2.8 | 2.8 | 3.3 | 3.9 | 3.8 | 2.1 | |
| Silver | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.01 | |
| Strontium | 52 | 64 | 64 | 64 | 72 | 69 | 59 | |
| Sulfur | — | — | 1900 | 2100 | 2000 | 1900 | — | |
| Thallium | < 0.05 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | < 0.05 | |
| Titanium | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.01 | |
| Vanadium | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.01 | |
| Zinc | 0.024 | 0.017 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | 0.021 | |
| Zirconium | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.01 | |

Deep Monitoring Well (MDHW-1)

| Parameter (mg/l) | 1st Round 192 m | 2nd Round 192 m | 3rd Round 192 m | 4th Round 192 m | 1st Round 207 m | 2nd Round 207 m | 3rd Round 207 m | 4th Round 207 m |
|------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Fluoride | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Chloride | 44000 | 34000 | 32000 | 28000 | 93000 | 56000 | 38000 | 37000 |
| Nitric (as N) | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 |
| Bromide | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | 110 | < 80 |
| Nitrate (as N) | < 20 | < 20 | < 20 | < 20 | 20 | < 20 | < 20 | < 20 |
| Phosphate (as P) | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 |
| Sulfate | 3100 | 3900 | 3700 | 4000 | 120 | 1900 | 2200 | 2600 |
| Alkalinity (as CaCO ₃) | 640 | 860 | 720 | 830 | 190 | 380 | 430 | 440 |
| Calcium | 2700 | 1800 | 1700 | 1900 | 13000 | 5000 | 4200 | 4100 |
| Magnesium | 1300 | 910 | 880 | 980 | 4400 | 1600 | 1700 | 1600 |
| Sodium | 18000 | 17000 | 16000 | 16000 | 37000 | 19000 | 18000 | 20000 |
| Potassium | 210 | 110 | 110 | 120 | 1000 | 370 | 290 | 280 |
| Aluminum | 0.10 | 0.058 | 1.2 | 2.9 | 0.16 | 0.10 | 1.7 | 3.4 |
| Barium | 0.026 | 0.016 | 0.02 | 0.071 | 0.026 | 0.017 | 0.01 | 0.053 |
| Beryllium | < 0.001 | < 0.001 | < 0.01 | < 0.02 | < 0.001 | < 0.001 | < 0.01 | < 0.02 |
| Boron | 12 | 15 | 14 | 20 | 25 | 22 | 19 | 28 |
| Cadmium | < 0.005 | < 0.005 | < 0.05 | < 0.05 | < 0.005 | < 0.005 | < 0.05 | < 0.05 |
| Chromium | 0.14 | < 0.01 | < 0.1 | < 0.1 | 0.13 | 0.29 | 0.37 | < 0.1 |
| Cobalt | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Copper | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Iron | 0.20 | < 0.01 | < 0.1 | 0.31 | 0.10 | 0.091 | 0.18 | < 0.1 |
| Lead | < 0.04 | < 0.04 | < 0.4 | < 0.4 | < 0.04 | < 0.04 | < 0.4 | < 0.4 |
| Manganese | 0.043 | 0.015 | < 0.05 | < 0.05 | 0.071 | 0.084 | 0.14 | < 0.05 |
| Molybdenum | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Nickel | < 0.01 | < 0.01 | < 0.1 | < 0.1 | 0.018 | 0.016 | < 0.1 | < 0.1 |
| Phosphorous | < 0.1 | 1.5 | 2.6 | 6.3 | 7.0 | 11 | 7.4 | 4.3 |
| Silicon | 1.6 | 1.7 | 1.7 | 2.8 | 1.4 | 2.3 | 2.4 | 3.3 |
| Silver | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Strontium | 43 | 39 | 37 | 41 | 150 | 98 | 83 | 82 |
| Sulfur | — | — | 11000 | 5300 | — | — | 5000 | 5900 |
| Thallium | < 0.05 | < 0.5 | < 0.5 | < 0.5 | < 0.05 | < 0.5 | < 0.5 | < 0.5 |
| Titanium | < 0.01 | < 0.01 | < 0.1 | < 0.1 | 0.052 | < 0.01 | < 0.1 | < 0.1 |
| Vanadium | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |
| Zinc | 0.032 | 0.13 | < 0.1 | < 0.1 | 0.037 | 0.014 | < 0.1 | < 0.1 |
| Zirconium | < 0.01 | < 0.01 | < 0.1 | < 0.1 | < 0.01 | < 0.01 | < 0.1 | < 0.1 |

Deep Monitoring Well (MDMW-1)

| Parameter (mg/l) | 3rd Round 228 m | 4th Round 228 m | 1st Round 240 m | 4th Round 240 m | 1st Round 271.5 m | 1st Round 291 m |
|------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------|-----------------------|
| Fluoride | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Chloride | 120000 | 120000 | 120000 | 160000 | 130000 | 120000 |
| Nitrite (as N) | < 20 | < 20 | < 20 | < 20 | < 20 | < 20 |
| Bromide | 410 | < 80 | < 80 | < 80 | < 80 | < 80 |
| Nitrate (as N) | < 20 | < 20 | 16 | < 20 | 16 | 14 |
| Phosphate (as P) | < 80 | < 80 | < 80 | < 80 | < 80 | < 80 |
| Sulfate | 1500 | 1800 | 88 | 1000 | 79 | 79 |
| Alkalinity (as CaCO ₃) | 420 | 410 | 190 | 240 | 210 | 240 |
| Calcium | 5900 | 6800 | 14000 | 16000 | 18000 | 16000 |
| Magnesium | 2500 | 2800 | 4400 | 4800 | 5800 | 5400 |
| Sodium | 51000 | 64000 | 47000 | 54000 | 46000 | 43000 |
| Potassium | 570 | 600 | 1300 | 1300 | 1300 | 1300 |
| Aluminum | 0.95 | 3.0 | 0.19 | 2.6 | 0.22 | 0.19 |
| Barium | 0.01 | < 0.1 | 0.005 | < 0.02 | 0.017 | 0.039 |
| Beryllium | < 0.01 | 0.063 | < 0.001 | < 0.01 | < 0.001 | < 0.001 |
| Boron | 62 | 100 | 35 | 91 | 28 | 28 |
| Cadmium | < 0.05 | < 0.05 | < 0.005 | < 0.05 | < 0.005 | < 0.005 |
| Chromium | < 0.1 | < 0.1 | 0.026 | < 0.1 | 0.027 | 0.015 |
| Cobalt | < 0.1 | < 0.1 | < 0.01 | < 0.1 | < 0.01 | < 0.01 |
| Copper | < 0.1 | < 0.1 | < 0.01 | < 0.1 | < 0.01 | < 0.01 |
| Iron | 0.93 | < 0.1 | < 0.01 | < 0.1 | < 0.01 | < 0.01 |
| Lead | < 0.04 | < 0.4 | < 0.04 | < 0.4 | < 0.04 | < 0.04 |
| Manganese | < 0.05 | < 0.05 | 0.010 | < 0.05 | 0.023 | 0.034 |
| Molybdenum | < 0.1 | < 0.1 | < 0.01 | < 0.1 | < 0.01 | < 0.01 |
| Nickel | 0.18 | < 0.1 | 0.022 | < 0.1 | < 0.01 | < 0.01 |
| Phosphorous | 2.3 | < 2 | 4.1 | < 2 | 2.4 | 3.5 |
| Silicon | 2.1 | 2.9 | 1.1 | 1.5 | 1.1 | 1.2 |
| Silver | < 0.1 | < 0.1 | < 0.01 | < 0.1 | < 0.01 | < 0.01 |
| Strontium | 120 | 130 | 160 | 310 | 180 | 180 |
| Sulfur | 7900 | 12000 | — | 1400 | — | — |
| Thallium | < 0.5 | < 0.5 | < 0.05 | < 0.5 | < 0.05 | < 0.05 |
| Titanium | < 0.1 | < 0.1 | 0.043 | < 0.1 | 0.052 | 0.053 |
| Vanadium | < 0.1 | < 0.1 | < 0.01 | < 0.1 | < 0.01 | < 0.01 |
| Zinc | < 0.1 | < 0.1 | 0.013 | < 0.1 | 0.017 | 0.021 |
| Zirconium | < 0.1 | < 0.1 | < 0.01 | < 0.1 | < 0.01 | < 0.01 |

Deep Monitoring Well (NDMW-1)

| Parameter (mg/l) | 1st Equipment Rinse | 2nd Equipment Rinse | 3rd Equipment Rinse | 4th Equipment Rinse |
|------------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| Fluoride | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Chloride | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Nitric (as N) | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Bromide | < 0.8 | < 0.8 | < 0.8 | < 0.8 |
| Nitrate (as N) | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Phosphate (as P) | < 0.8 | < 0.8 | < 0.8 | < 0.8 |
| Sulfate | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Alkalinity (as CaCO ₃) | < 1 | < 1 | < 1 | < 1 |
| Calcium | 0.18 | 0.14 | 0.047 | < 0.2 |
| Magnesium | 0.034 | 0.025 | 0.023 | < 0.05 |
| Sodium | 0.73 | 0.28 | 0.89 | < 1 |
| Potassium | < 0.4 | < 0.4 | < 0.4 | < 0.5 |
| Aluminum | 0.15 | < 0.03 | < 0.03 | 0.17 |
| Barium | 0.0185 | 0.002 | 0.001 | < 0.002 |
| Beryllium | < 0.001 | < 0.001 | < 0.001 | < 0.0003 |
| Boron | 0.23 | 0.011 | 0.23 | 0.34 |
| Cadmium | < 0.005 | < 0.005 | < 0.005 | < 0.006 |
| Chromium | < 0.01 | < 0.01 | < 0.01 | 0.096 |
| Cobalt | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Copper | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Iron | 0.065 | 0.047 | < 0.01 | 0.41 |
| Lead | < 0.04 | < 0.04 | < 0.04 | < 0.04 |
| Manganese | < 0.005 | < 0.005 | < 0.005 | < 0.01 |
| Molybdenum | < 0.01 | < 0.01 | < 0.01 | < 0.02 |
| Nickel | < 0.01 | < 0.01 | < 0.01 | 0.06 |
| Phosphorous | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Silicon | 0.092 | 0.25 | < 0.05 | 0.15 |
| Silver | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Strontium | < 0.001 | 0.002 | 3.7 | < 0.005 |
| Sulfur | — | — | 7.0 | < 0.2 |
| Thallium | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Titanium | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Vanadium | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Zinc | 0.082 | 0.029 | < 0.01 | < 0.01 |
| Zirconium | < 0.01 | < 0.01 | < 0.01 | < 0.01 |

| Parameter (mg/L-1) | Westbay Casing Rinse | City of Sarnia Water | During Drilling MOHLS-1 229.8-254.2m | During Drilling MOHLS-2 247.5-260.3m | Flare Line Discharge MO-1 196.3m | Drill Water Return MOHJ-1-DUR 165.9m |
|---|----------------------------|----------------------------|---|---|---|---|
| COPPER, UNF. TOTAL. CUUT, MG/L as Cu 522AE2 | <.001< | .001 | <.10< | <.10< | + | <.001< |
| NICKEL, UNF. TOTAL NIUT, MG/L as Ni 522AE2 | .042 | .011 | <.10< | <.10< | + | .002 |
| LEAD, UNF. TOTAL PBUS, MG/L as Pb 522AE2 | <.003< | <.003< | <.40< | <.40< | + | <.003< |
| ZINC, UNF. TOTAL ZNUU, MG/L as Zn 522AE2 | .034 | <.001< | <.10< | <.10< | + | <.002< |
| MANGANESE, UNF. TOTAL MNUU, MG/L as Mn 522AE2 | .034 | .031 | .18 | .76 | + | .042 |
| ARSENIC, UNF. TOTAL ASUT, MG/L as As 540AF3 | .012 | .014 | — | — | .011 | <.001< |
| CADMIUM, UNF. TOTAL CDUT, MG/L as Cd 522AE2 | <.0003< | <.0003< | <.010< | <.010< | + | <.0003< |
| COBALT, UNF. TOTAL COUT, MG/L as Co 522AE2 | .025 | .025 | <.10< | <.10< | + | .001 |
| CHROMIUM, UNF. TOTAL CRUT, MG/L as Cr 522AE2 | .050 | .013 | <.10< | .38 | + | .001 |
| MOLYBDENUM, UNF. TOTAL MOUT, MG/L as Mo 522AE2 | .011 | .007 | .07 | .18 | + | .010 |
| SELENIUM, UNF. TOTAL SEUT, MG/L as Se 540AF3 | <.001< | <.001< | — | — | <.001< | <.001< |
| STRONTIUM, UNF. TOTAL SRUT, MG/L as Sr 522AE2 | 2.100 | 1.900 | 13.00 | 270.00 | + | .310 |
| VANADIUM, UNF. TOTAL VUUT, MG/L as V 522AE2 | <.001< | <.001< | <.10< | 1.20 | + | <.001< |
| CYANIDE, FREE, UNF. REACT. CCNFUR, MG/L as CN 306AC2 | — | — | <.001<u | .019 | — | — |

+ Not reported

MOE - SARNIA

DEEP MONITORING WELL

QA/QC and Samples Taken During Drilling

| Parameter (mg/L) | Westbay Casing Rinse | City of Sarnia Water | During Drilling MDMLS-1 229.8-254.2m | During Drilling MDMLS-2 247.5-260.3m | Flare Line Discharge MD-1 196.3m | Drill Water Return MDMW-1-DWR 165.9m |
|------------------------------------|----------------------------|----------------------------|---|---|---|---|
| pH | 7.94* | 7.93 | 7.62 | 5.96 | 8.2 | 8.02* |
| Conductivity (umhos) | - | - | - | - | 2490 | - |
| Alkalinity (as CaCO ₃) | .01 | 72 | + | + | + | 180 |
| Chloride | .17 | 6.8 | 3935 | 246640 | 57156 | 446 |
| Fluoride | <0.1 | 1.1 | .9 | .3 | 2.3 | 1.3 |
| Ammonia (as N) | .06 | <0.005 | + | + | + | .58 |
| Nitrate (as N) | .3 | .5 | + | + | + | 1.8 |
| Sulphate | <0.5 | 21 | 3000 | 1200 | 5150 | 93 |
| Phenols (ug/L) | <1.0 | <1.0 | + | + | + | - |
| Calcium | 2.4 | 27 | + | + | + | 30 |
| Magnesium | .5 | 7.3 | + | + | + | 8.1 |
| Calculated Hardness | 8 | 97 | + | + | + | 108 |
| Sodium | .4 | 3 | + | + | + | 300 |
| Potassium | .1 | .9 | + | + | + | 24.6 |
| Iron | .01 | .91 | + | + | + | .16 |
| Manganese | <0.001 | .012 | + | + | + | .05 |

* Laboratory measurement

+ Not reported

- Analysis not performed

APPENDIX K2

Borehole MDMW-1
Volatile Organics

Analyses by:

Barringer-Magenta Ltd.
Rexdale, Ontario

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

‡ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MD-1 1ST QTR DF=10 | MDMS-2 1ST QTR | 1-61.5M 2ND QTR DF=100 | 1-61.5M 4TH QTR DF=100 | 1-75M 1ST QTR DF=100 | 1-75M 2ND QTR DF=100 | 1-75M 3RD QTR DF=100 |
|----------------------------------|----------------|--------------------------|-------------------|------------------------------|------------------------------|----------------------------|----------------------------|----------------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACRYLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | 2220.0 | 32.1 | ND | ND | ND | ND | ND |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | 5.8 | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | 69.0 | ND | ND | 97.0 | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | 14.5 | 522.0 | 490.0 | 544.0 | 365.0 | 520.0 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | 1360.0 | 24.2 | 318.0 | 492.0 | 444.0 | 198.0 | 370.0 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | 147.0 | 3.3 | 57.0 | 47.3 | 136.0 | 127.0 | 60.0 |
| 34 M-XYLENE & P-XYLENE | .5 | 547.0 | 24.7 | 278.0 | 271.0 | 218.0 | 135.0 | 298.0 |
| 35 O-XYLENE | .5 | 257.0 | 8.6 | 150.0 | 137.0 | 119.0 | 81.0 | 131.0 |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | 26.9 | 0.6 | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | 69.5 | 0.7 | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

1 = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

M = MERGED COMPOUNDS

| COMPOUND | M.D.L. UG/L | MD-1 1ST QTR DF=10 | MDMLS-2 1ST QTR | 1-61.5M 2ND QTR DF=100 | 1-61.5M 4TH QTR DF=100 | 1-75M 1ST QTR DF=100 | 1-75M 2ND QTR DF=100 | 1-75M 3RD QTR DF=100 |
|------------------------------|----------------|--------------------------|--------------------|------------------------------|------------------------------|----------------------------|----------------------------|----------------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | M141.0 | 5.8 | 32.0 | 33.2 | 48.0 | 115.0 | 29.0 |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | M116.0 | ND | 21.0 | 119.9 | ND | 110.0 | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | 30.0 | 1.1 | ND | 110.4 | ND | ND | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | 127.0 | 10.5 | 75.0 | ND | 61.0 | 38.0 | 65.0 |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | 74.9 | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | 62.1 | 3.8 | 39.0 | ND | 34.0 | 21.0 | 31.0 |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | 39.1 | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | 26.9 | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | 20.0 | 0.6 | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|----------------------------|---------|------|------|-----|------|------|------|-----|
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 95% | 96% | 76% | 135% | 101% | 90% | 95% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 139% | 164% | 99% | 120% | 103% | 101% | 92% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 106% | 113% | 96% | 110% | 93% | 99% | 80% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| | COMPOUND | M.D.L. UG/L | 1-75M | 1-123M | 1-123M | 1-123M | 1-123M | 1-123M | 1-180M |
|----|--------------------------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|---------------------------------|-------------------|
| | | | 4TH QTR DF=100 | 1ST QTR DF=100 | 2ND QTR DF=100 | 3RD QTR DF=100 | 4TH QTR DF=100 | 1-123M DUP 4TH QTR DF=100 | 1ST QTR DF=100 |
| 1 | CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 | VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 | CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 | TRICHLOROFLUOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 | BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 | ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 | 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 | 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 | DICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 | ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 | TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 | 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 | CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 | CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 | 1,1,1-TRICHLOROETHANE | .5 | ND | ND | 55.0 | ND | ND | ND | ND |
| 16 | CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 | BENZENE | .5 | 521.0 | 795.0 | 551.0 | 622.0 | 622.0 | 961.0 | 432.0 |
| 18 | 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 | TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 | 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 | BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 | DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 | DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 | 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 | CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 | TOLUENE | .5 | 463.0 | 650.0 | 267.0 | 410.0 | 469.0 | 654.0 | 195.0 |
| 27 | TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 | 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 | TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 | DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 | 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 | CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 | ETHYLBENZENE | .5 | 54.9 | 52.0 | 129.0 | 138.0 | 44.3 | 47.4 | 111.0 |
| 34 | M-XYLENE & P-XYLENE | .5 | 311.0 | 295.0 | 132.0 | 231.0 | 240.0 | 264.0 | 58.0 |
| 35 | O-XYLENE | .5 | 148.0 | 160.0 | 80.0 | 104.0 | 118.0 | 137.0 | 140.0 |
| 36 | STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 | ISOPROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 38 | BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 | 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 | PROPYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-75M 4TH QTR DF=100 | 1-123M 1ST QTR DF=100 | 1-123M 2ND QTR DF=100 | 1-123M 3RD QTR DF=100 | 1-123M 4TH QTR DF=100 | 1-123M DUP 4TH QTR DF=100 |
|------------------------------|----------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|---------------------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | 33.6 | 57.0 | *12.0 | 20.0 | 24.5 | 25.1 |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | *19.6 | ND | ND | ND | *14.5 | *14.5 |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | *11.1 | *11.0 | ND | ND | *7.4 | *8.6 |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | 70.0 | 32.0 | 46.0 | ND | ND |
| 46 PENTACHLOROETHANE | 1.0 | 76.6 | ND | ND | ND | 56.9 | 60.4 |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | 38.0 | 20.0 | 25.0 | ND | ND |
| 49 1,4-DICHLOROBENZENE | .5 | 38.1 | ND | ND | ND | 28.6 | 33.2 |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | |
|----------------------------|---------|------|------|------|-----|------|------|
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 112% | 101% | 83% | 98% | 110% | 121% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 103% | 103% | 96% | 88% | 105% | 112% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 89% | 93% | 101% | 67% | 95% | 118% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-190M 2ND QTR DF=100 | 1-192.5M 1ST QTR DF=100 | 1-192M 2ND QTR DF=100 | 1-192.5M 3RD QTR DF=100 | 1-192M 4TH QTR DF=100 | 1-207M 1ST QTR DF=25 | 1-207M RPT 1ST QTR DF=25 |
|----------------------------------|----------------|-----------------------------|-------------------------------|-----------------------------|-------------------------------|-----------------------------|----------------------------|--------------------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | 661.0 | 646.0 | 952.0 | 1580.0 | 647.0 | 51.1 | 54.4 |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | 285.0 | 563.0 | 160.0 | 5980.0 | 440.0 | 87.9 | 56.9 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | 51.0 | 121.0 | 123.0 | 1630.0 | 60.5 | 15.7 | 15.7 |
| 34 M-XYLENE & P-XYLENE | .5 | 219.0 | 82.0 | 324.0 | 4470.0 | 158.0 | 95.5 | 29.5 |
| 35 O-XYLENE | .5 | 120.0 | 66.0 | 224.0 | 2190.0 | 84.6 | 41.0 | 20.4 |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | ND | ND | 50.0 | 29.6 | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | ND | ND | 195.0 | 116.0 | 12.7 | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-190M | 1-192.5M | 1-192M | 1-192.5M | 1-192M | 1-207M | 1-207M RP |
|--------------------------------|----------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|------------------|
| | | 2ND QTR DF=100 | 1ST QTR DF=100 | 2ND QTR DF=100 | 3RD QTR DF=100 | 4TH QTR DF=100 | 1ST QTR DF=25 | 1ST QTR DF=25 |
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | 31.0 | ND | 24.0 | 550.0 | 430.0 | 24.0 | 8.8 |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | 20.0 | *13.0 | 20.0 | 256.0 | 149.0 | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | *12.0 | ND | *13.0 | 282.0 | 154.0 | *3.9 | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | 66.0 | *13.0 | 44.0 | 742.0 | ND | 28.2 | 12.1 |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | 32.0 | ND | 22.0 | ND | 470.0 | 14.1 | 7.9 |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | *13.7 | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | 148.0 | 61.6 | *3.0 | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 148% | 116% | 143% | 104% | 152% | 119% | 115% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 98% | 109% | 96% | 98% | 133% | 125% | 128% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 102% | 90% | 100% | 105% | 151% | 108% | 102% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. US/L | 1-207M 2ND QTR DF=10 | 1-207M 3RD QTR DF=25 | 1-207M 4TH QTR DF=25 | 1-228M 3RD QTR DF=25 | 1-228M 4TH QTR DF=25 | 1-240M 1ST QTR DF=10 | 1-240M 2ND QTR DF=5 |
|----------------------------------|----------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---------------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 ACRYLEIN | 25.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | ND | 39.2 | 52.4 | 194.0 | 262.0 | 19.3 | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | ND | 66.2 | 223.0 | 22.2 | 49.2 | 117.0 | ND |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | ND | 31.3 | 26.6 | 15.7 | 15.6 | 11.8 | ND |
| 34 M-XYLENE & P-XYLENE | .5 | ND | 157.0 | 145.0 | 32.8 | 31.2 | 47.9 | ND |
| 35 O-XYLENE | .5 | ND | 68.0 | 65.4 | 19.2 | 20.6 | 26.9 | ND |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | ND | 5.0 | 5.6 | ND | ND | 11.4 | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | ND | 7.0 | 6.7 | ND | ND | 11.8 | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-207M 2ND QTR DF=10 | 1-207M 3RD QTR DF=25 | 1-207M 4TH QTR DF=25 | 1-228M 3RD QTR DF=25 | 1-228M 4TH QTR DF=25 | 1-240M 1ST QTR DF=10 | 1-240M 2ND QTR DF=5 |
|------------------------------|----------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---------------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3,4-METHYLBENZENE | .2 | ND | 32.1 | 34.0 | 14.7 | 5.3 | 9.2 | ND |
| 43 1,2,5-TRIMETHYLBENZENE | .2 | ND | 20.0 | 22.4 | 12.6 | 13.0 | 5.7 | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND | 10.8 | 10.8 | 12.0 | 12.1 | 12.8 | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND | 70.0 | 73.9 | 10.6 | 11.5 | 20.4 | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND | 31.1 | 35.6 | 5.2 | 6.9 | 11.8 | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | 7.7 | 7.2 | ND | ND | 11.9 | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|----------------------------|---------|-----|------|------|------|------|----|------|
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 93% | 96% | 150% | 93% | 132% | -- | 98% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 96% | 109% | 167% | 107% | 103% | -- | 111% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 89% | 99% | 146% | 79% | 116% | -- | 94% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-240M 4TH QTR DF=25 | 1-271.5M 1ST QTR DF=5 | 1-271M 2ND QTR DF=5 | 1-271M RPT 2ND QTR DF=100 | 1-291M 1ST QTR DF=10 | 1-291M 2ND QTR DF=5 |
|----------------------------------|----------------|----------------------------|-----------------------------|---------------------------|---------------------------------|----------------------------|---------------------------|
| 1 CHLOROMETHANE | 5.0 | ND | ND | ND | ND | ND | ND |
| 2 VINYL CHLORIDE | 5.0 | ND | ND | ND | ND | ND | ND |
| 3 CHLOROETHANE | 5.0 | ND | ND | ND | ND | ND | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 5 BROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 6 ACROLEIN | 25.0 | ND | ND | ND | ND | ND | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 9 DICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND |
| 10 ACRYLONITRILE | 10.0 | ND | ND | ND | ND | ND | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND |
| 14 CHLOROFORM | .5 | ND | ND | ND | ND | ND | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND | ND | ND | ND | ND | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND | ND | ND | ND | ND | ND |
| 17 BENZENE | .5 | 26.7 | 7.0 | ND | ND | 61.7 | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND |
| 19 TRICHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND | ND | ND | ND | ND | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND | ND | ND | ND | ND | ND |
| 22 DIBROMOMETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND | ND | ND | ND | ND | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 26 TOLUENE | .5 | 539.0 | 14.5 | ND | ND | 79.6 | ND |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 29 TETRACHLOROETHENE | .5 | ND | ND | ND | ND | ND | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 32 CHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 33 ETHYLBENZENE | .5 | 44.5 | 11.9 | ND | ND | 6.4 | ND |
| 34 M-XYLENE & P-XYLENE | .5 | 66.1 | 11.2 | ND | ND | 35.0 | ND |
| 35 O-XYLENE | .5 | 43.4 | 6.7 | ND | ND | 21.0 | ND |
| 36 STYRENE | .5 | ND | ND | ND | ND | ND | ND |
| 37 ISOPROPYLBENZENE | .2 | 12.5 | ND | ND | ND | ND | ND |
| 38 BROMOFORM | 2.0 | ND | ND | ND | ND | ND | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 40 PROPYLBENZENE | .2 | 12.6 | ND | ND | ND | ND | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-240M 4TH QTR DF=25 | 1-271.5M 1ST QTR DF=5 | 1-271M 2ND QTR DF=5 | 1-271M RPT 2ND QTR DF=100 | 1-291M 1ST QTR DF=10 | 1-291M 2ND QTR DF=5 |
|------------------------------|----------------|----------------------------|-----------------------------|---------------------------|---------------------------------|----------------------------|---------------------------|
| 41 BROMOBENZENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | 8.8 | 1.3 | ND | ND | 6.7 | ND |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | 84.9 | 8.8 | ND | ND | ND | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | 83.5 | ND | ND | ND | 81.3 | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | 19.1 | 3.0 | ND | ND | 8.8 | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | 10.0 | 2.0 | ND | ND | 5.1 | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND | ND | ND | ND | ND | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND | ND | ND | ND | ND | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | |
|----------------------------|---------|------|------|-----|------|------|------|
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 140% | 115% | 58% | 91% | 108% | 64% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 112% | 125% | 99% | 110% | 119% | 109% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 129% | 101% | 88% | 103% | 100% | 90% |

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VOLATILE ORGANICS RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. US/L | WESTBAY 1ST QTR DBH QA/QC |
|----------------------------------|----------------|---------------------------------|
| 1 CHLOROMETHANE | 5.0 | ND |
| 2 VINYL CHLORIDE | 5.0 | ND |
| 3 CHLOROETHANE | 5.0 | ND |
| 4 TRICHLOROFLUOROMETHANE | 2.0 | 5.0 |
| 5 BROMOMETHANE | 2.0 | ND |
| 6 ACROLEIN | 25.0 | ND |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 2.0 | ND |
| 8 1,1-DICHLOROETHENE | 1.0 | ND |
| 9 DICHLOROMETHANE | 1.0 | 712.0 |
| 10 ACRYLONITRILE | 10.0 | ND |
| 11 TRANS-1,2-DICHLOROETHENE | .5 | ND |
| 12 1,1-DICHLOROETHANE | .5 | ND |
| 13 CIS-1,2-DICHLOROETHENE | .5 | ND |
| 14 CHLOROFORM | .5 | ND |
| 15 1,1,1-TRICHLOROETHANE | .5 | ND |
| 16 CARBON TETRACHLORIDE | .5 | ND |
| 17 BENZENE | .5 | ND |
| 18 1,2-DICHLOROETHANE | 1.0 | ND |
| 19 TRICHLOROETHENE | .5 | ND |
| 20 1,2-DICHLOROPROPANE | 1.0 | ND |
| 21 BROMODICHLOROMETHANE | 1.0 | ND |
| 22 DIBROMOMETHANE | 2.0 | ND |
| 23 DICHLOROACETONITRILE | 15.0 | ND |
| 24 1-BROMO-2-CHLOROETHANE | 2.0 | ND |
| 25 CIS-1,3-DICHLOROPROPENE | 1.0 | ND |
| 26 TOLUENE | .5 | 1.4 |
| 27 TRANS-1,3-DICHLOROPROPENE | 1.0 | ND |
| 28 1,1,2-TRICHLOROETHANE | 2.0 | ND |
| 29 TETRACHLOROETHENE | .5 | ND |
| 30 DIBROMOCHLOROMETHANE | 2.0 | ND |
| 31 1,2-DIBROMOETHANE | 2.0 | ND |
| 32 CHLOROBENZENE | .5 | ND |
| 33 ETHYLBENZENE | .5 | ND |
| 34 M-XYLENE & P-XYLENE | .5 | 1.2 |
| 35 O-XYLENE | .5 | 1.1 |
| 36 STYRENE | .5 | 1.3 |
| 37 ISOPROPYLBENZENE | .2 | ND |
| 38 BROMOFORM | 2.0 | ND |
| 39 1,1,2,2-TETRACHLOROETHANE | 2.0 | ND |
| 40 PROPYLBENZENE | .2 | ND |

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VOLATILE ORGANICS RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | WESTBAY 1ST QTR DBH QA/QC |
|------------------------------|----------------|---------------------------------|
| 41 BROMOBENZENE | 1.0 | ND |
| 42 1-ETHYL-3&4-METHYLBENZENE | .2 | 1.1 |
| 43 1,3,5-TRIMETHYLBENZENE | .2 | ND |
| 44 1-ETHYL-2-METHYLBENZENE | .2 | ND |
| 45 1,2,4-TRIMETHYLBENZENE | .2 | ND |
| 46 PENTACHLOROETHANE | 1.0 | ND |
| 47 1,3-DICHLOROBENZENE | .5 | ND |
| 48 1,2,3-TRIMETHYLBENZENE | .2 | ND |
| 49 1,4-DICHLOROBENZENE | .5 | ND |
| 50 1,3-DIETHYLBENZENE | .2 | ND |
| 51 1,4-DIETHYLBENZENE | .2 | ND |
| 52 1,2-DIETHYLBENZENE | .2 | ND |
| 53 1,2-DICHLOROBENZENE | .5 | ND |
| 54 HEXACHLOROETHANE | 1.0 | ND |
| 55 1,2,4-TRICHLOROBENZENE | 1.0 | ND |
| 56 HEXACHLORO-1,3-BUTADIENE | .5 | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | |
|----------------------------|---------|-----|
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 96% |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 95% |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 95% |

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SPIKED VOLATILE SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | 1-75M 1ST QTR | 1-240M 4TH QTR | 1-291M 2ND QTR |
|----------------------------------|----------------|------------------|-------------------|-------------------|
| 1 CHLOROMETHANE | 20.0 | 169 | 58 | 93 |
| 2 VINYL CHLORIDE | 20.0 | 148 | 94 | 119 |
| 3 CHLOROETHANE | 20.0 | 191 | 74 | 71 |
| 4 TRICHLOROFLUOROMETHANE | 5.0 | 76 | 47 | 91 |
| 5 BROMOMETHANE | 20.0 | 179 | 102 | 99 |
| 6 ACROLEIN | 21.0 | 0 | 29 | 55 |
| 7 1,1,2-TRICHLOROTRIFLUOROETHANE | 5.0 | 164 | 115 | 123 |
| 8 1,1-DICHLOROETHENE | 5.0 | 321 | 99 | 103 |
| 9 DICHLOROMETHANE | 5.0 | 49 | 76 | 89 |
| 10 ACRYLONITRILE | 30.2 | 85 | 101 | 89 |
| 11 TRANS-1,2-DICHLOROETHENE | 5.0 | 105 | 116 | 95 |
| 12 1,1-DICHLOROETHANE | 5.0 | 139 | 113 | 76 |
| 13 CIS-1,2-DICHLOROETHENE | 5.0 | 87 | 119 | 78 |
| 14 CHLOROFORM | 5.0 | 118 | 119 | 98 |
| 15 1,1,1-TRICHLOROETHANE | 5.0 | 122 | 136 | 93 |
| 16 CARBON TETRACHLORIDE | 5.0 | 129 | 110 | 93 |
| 17 BENZENE | 5.0 | 87 | 131 | 102 |
| 18 1,2-DICHLOROETHANE | 5.0 | 110 | 121 | 98 |
| 19 TRICHLOROETHENE | 5.0 | 127 | 139 | 96 |
| 20 1,2-DICHLOROPROPANE | 5.0 | 146 | 128 | 109 |
| 21 BROMODICHLOROMETHANE | 5.0 | 115 | 115 | 86 |
| 22 DIBROMOMETHANE | 6.1 | 113 | 132 | 102 |
| 23 DICHLOROACETONITRILE | 27.4 | 112 | | 44 |
| 24 1-BROMO-2-CHLOROETHANE | 5.9 | 128 | 116 | 99 |
| 25 CIS-1,3-DICHLOROPROPENE | 6.2 | 116 | 105 | 108 |
| 26 TOLUENE | 5.0 | 97 | 646 | 92 |
| 27 TRANS-1,3-DICHLOROPROPENE | 3.8 | 125 | 41 | 95 |
| 28 1,1,2-TRICHLOROETHANE | 5.0 | 124 | 132 | 97 |
| 29 TETRACHLOROETHENE | 5.0 | 115 | 137 | 91 |
| 30 DIBROMOCHLOROMETHANE | 5.0 | 94 | 88 | 87 |
| 31 1,2-DIBROMOETHANE | 6.0 | 96 | 114 | 88 |
| 32 CHLOROBENZENE | 5.0 | 91 | 121 | 85 |
| 33 ETHYLBENZENE | 5.0 | 85 | 158 | 83 |
| 34 M-XYLENE & P-XYLENE | 1.5 | 19 | 302 | 92 |
| 35 O-XYLENE | 2.0 | 14 | 244 | 87 |
| 36 STYRENE | 2.0 | 101 | 127 | 90 |
| 37 ISOPROPYLBENZENE | 2.0 | 91 | 118 | 84 |
| 38 BROMOFORM | 5.0 | 89 | 60 | 85 |
| 39 1,1,2,2-TETRACHLOROETHANE | 5.0 | 98 | 136 | 93 |
| 40 PROPYLBENZENE | 1.9 | 93 | 115 | 86 |

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SPIKED VOLATILE SAMPLES - PERCENT RECOVERIES (CONTINUED)

| COMPOUND | AMOUNT UG/L | 1-75M 1ST QTR | 1-240M 4TH QTR | 1-291M 2ND QTR |
|--------------------------------|----------------|------------------|-------------------|-------------------|
| 41 BROMOBENZENE | 3.4 | 90 | 124 | 84 |
| 42 1-ETHYL-3&4-METHYLBENZENE | 1.9 | 71 | 141 | 86 |
| 43 1,3,5-TRIMETHYLBENZENE | 2.0 | 107 | 133 | 87 |
| 44 1-ETHYL-2-METHYLBENZENE | 2.0 | 100 | 124 | 86 |
| 45 1,2,4-TRIMETHYLBENZENE | 1.9 | 86 | 157 | 85 |
| 46 PENTACHLOROETHANE | 2.9 | 105 | 69 | 90 |
| 47 1,3-DICHLOROBENZENE | 2.5 | 97 | 124 | 86 |
| 48 1,2,3-TRIMETHYLBENZENE | 2.0 | 94 | 172 | 87 |
| 49 1,4-DICHLOROBENZENE | 2.9 | 94 | 123 | 88 |
| 50 1,3-DIETHYLBENZENE | 2.0 | 95 | 118 | 84 |
| 51 1,4-DIETHYLBENZENE | 1.9 | 103 | 122 | 88 |
| 52 1,2-DIETHYLBENZENE | 1.9 | 97 | 126 | 86 |
| 53 1,2-DICHLOROBENZENE | 3.0 | 93 | 118 | 89 |
| 54 HEXACHLOROETHANE | 2.5 | 138 | 14 | 76 |
| 55 1,2,4-TRICHLOROBENZENE | 3.0 | 104 | 129 | 89 |
| 56 HEXACHLORO-1,3-BUTADIENE | 2.0 | 92 | 126 | 85 |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | |
| 57 1-CHLORO-2-BROMOPROPANE | 10 UG/L | 127 | 134 | 109 |
| 58 1,4-DICHLOROBUTANE | 10 UG/L | 129 | 103 | 117 |
| 59 4-BROMOFLUOROBENZENE | 2 UG/L | 111 | 125 | 111 |

APPENDIX K3

Borehole MDMW-1
Base Neutral Extractables

Analyses by:

Barringer-Magenta Ltd.
Rexdale, Ontario

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

: = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MD-1 1ST QTR DF=4 | MDMLS-1 1ST QTR | MDMLS-2 1ST QTR | MDMLS-2 1ST QTR QC-REPEAT | 1-61.5M 2ND QTR DF=1.6 | 1-61.5M 3RD QTR | 1-61.5M 4TH QTR DF=1.6 |
|--------------------------------|----------------|-------------------------|--------------------|--------------------|---------------------------------|------------------------------|--------------------|------------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | 262.0 | 7.2 | 0.9 | 1.1 | 16.7 | 6.2 | 4.9 |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | 8.4 |
| 14 2-METHYLNAPHTHALENE | .5 | 199.0 | 2.4 | 0.6 | 0.7 | 11.5 | 4.7 | 2.9 |
| 15 1-METHYLNAPHTHALENE | .5 | 155.0 | 3.5 | 0.6 | 0.5 | 9.2 | 3.7 | 2.1 |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | 6.8 | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | 1.3 | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | 0.5 | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | 13.3 | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 5.8 | 2.0 | 3.1 | 3.2 | 1.1 | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | ND | ND | 6.8 | 2.8 | ND | ND | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

1 = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | MD-1 1ST QTR DF=4 | MDMS-1 1ST QTR | MDMS-2 1ST QTR | MDMS-2 1ST QTR QC-REPEAT | 1-61.5M 2ND QTR DF=1.6 | 1-61.5M 3RD QTR | 1-61.5M 4TH QTR DF=1.6 |
|---------------------------|----------------|-------------------------|-------------------|-------------------|--------------------------------|------------------------------|--------------------|------------------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | 3.2 | 1.6 | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(G,H,I)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|-----|-----|-----|-----|------|------|-----|
| 48 NITROBENZENE-D5 | 50 UG/L | 14% | 26% | 28% | 31% | 113% | 44% | 49% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 34% | 55% | 52% | 55% | 85% | 36% | 56% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 47% | 51% | 90% | 99% | 49% | 107% | 44% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

1 = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-75M 1ST QTR DF=100 | 1-75M 2ND QTR DF=16 | 1-75M DUPL 2ND QTR DF=10 | 1-75M 3RD QTR | 1-75M 4TH QTR DF=1.6 | 1-123M 1ST QTR DF=100 | 1-123M 2ND QTR DF=16 |
|--------------------------------|----------------|----------------------------|---------------------------|--------------------------------|------------------|----------------------------|-----------------------------|----------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | 8.6 | 8.2 | 5.7 | 5.4 | ND | \$6.0 |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | \$6.4 | 6.2 | 4.2 | 2.7 | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | \$4.7 | \$4.8 | 3.1 | 1.9 | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | 1.3 | ND | \$2.2 | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | 1.1 | ND | ND | ND | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

I = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-75M | 1-75M | 1-75M DUPL | 1-75M | 1-75M | 1-123M | 1-123M |
|---------------------------|----------------|-------------------|------------------|------------------|---------|-------------------|-------------------|------------------|
| | | 1ST QTR DF=100 | 2ND QTR DF=16 | 2ND QTR DF=10 | 3RD QTR | 4TH QTR DF=1.6 | 1ST QTR DF=100 | 2ND QTR DF=16 |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|----|----|----|-----|-----|----|----|
| 48 NITROBENZENE-D5 | 50 UG/L | -- | -- | -- | 54% | 55% | -- | -- |
| 49 2-FLUOROBIPHENYL | 50 UG/L | -- | -- | -- | 32% | 47% | -- | -- |
| 50 4-TERPHENYL-D14 | 50 UG/L | -- | -- | -- | 91% | 60% | -- | -- |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-123M 3RD QTR | 1-123M 4TH QTR DF=1.6 | 1-123M 4TH QTR DF=1.33 | 1-180M 1ST QTR DF=100 | 1-180M 2ND QTR DF=40 | 1-192M 1ST QTR DF=100 |
|--------------------------------|----------------|-------------------|-----------------------------|------------------------------|-----------------------------|----------------------------|-----------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | 4.0 | 6.9 | 5.6 | ND | 12.0 | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | 3.2 | 3.3 | 3.3 | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | 2.5 | 1.6 | 2.2 | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | 1.4 | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 5.1 | ND | ND | ND | ND | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-123M 3RD QTR | 1-123M 4TH QTR DF=1.6 | 1-123M DUP 4TH QTR DF=1.33 | 1-180M 1ST QTR DF=100 | 1-180M 2ND QTR DF=40 | 1-192M 1ST QTR DF=100 | 1-192M 2ND QTR DF=16 |
|---------------------------|----------------|-------------------|-----------------------------|----------------------------------|-----------------------------|----------------------------|-----------------------------|----------------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|-----|-----|------|----|----|----|----|
| 48 NITROBENZENE-D5 | 50 UG/L | 44% | 94% | 103% | -- | -- | -- | -- |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 35% | 87% | 65% | -- | -- | -- | -- |
| 50 4-TERPHENYL-D14 | 50 UG/L | 92% | 51% | 82% | -- | -- | -- | -- |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-192.5M 3RD QTR | 1-192M 4TH QTR DF=16 | 1-207M 1ST QTR DF=7.5 | 1-207M 2ND QTR DF=114 | 1-207M 3RD QTR | 1-207M 4TH QTR DF=1.33 |
|--------------------------------|----------------|---------------------|----------------------------|-----------------------------|-----------------------------|-------------------|------------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | 476.0 | 194.0 | 13.8 | ND | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | 5.9 | 5.4 |
| 14 2-METHYLNAPHTHALENE | .5 | 88.9 | 47.5 | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | 73.8 | 37.4 | ND | ND | 3.3 | 3.0 |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | ND | ND | ND | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | 24.9 | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | 10.1 | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-192.5M 3RD QTR | 1-192M 4TH QTR DF=16 | 1-207M 1ST QTR DF=7.5 | 1-207M 2ND QTR DF=114 | 1-207M 3RD QTR | 1-207M 4TH QTR DF=1.33 | 1-228M 3RD QTR |
|---------------------------|----------------|---------------------|----------------------------|-----------------------------|-----------------------------|-------------------|------------------------------|-------------------|
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 47 BENZO(GH)PERYLENE | 2.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | | | |
|---------------------|---------|-----|----|------|----|-----|-----|------|
| 48 NITROBENZENE-D5 | 50 UG/L | 98% | -- | 63% | -- | 47% | 52% | 139% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 85% | -- | 73% | -- | 57% | 79% | 73% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 92% | -- | 102% | -- | 97% | 89% | 119% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-228M 4TH QTR | 1-240M 1ST QTR DF=7.5 | 1-240M 4TH QTR DF=1.33 | 1-271.5M 1ST QTR DF=7.5 | 1-291M 1ST QTR DF=7.5 |
|--------------------------------|----------------|-------------------|-----------------------------|------------------------------|-------------------------------|-----------------------------|
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | 1.0 | ND | 1.5 | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | ND | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | 1.2 | ND | ND | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | ND | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | ND | 19.4 | ND | 12.7 | 10.5 |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | ND | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | ND | ND | ND | ND | ND |

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BASE-NEUTRAL RESULTS (CONT'D)

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | 1-228M | 1-240M | 1-240M | 1-271.5M | 1-291M |
|--------------------------------|---------|---------|---------|---------|----------|---------|
| | UG/L | 4TH QTR | 1ST QTR | 4TH QTR | 1ST QTR | 1ST QTR |
| | | | DF=7.5 | DF=1.33 | DF=7.5 | DF=7.5 |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | ND | ND | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND |
| SURROGATE STANDARD RECOVERIES: | AMOUNT | | | | | |
| 48 NITROBENZENE-D5 | 50 UG/L | 49% | 29% | 45% | 65% | 37% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 59% | 49% | 62% | 83% | 47% |
| 50 4-TERPHENYL-D14 | 50 UG/L | 92% | 70% | 32% | 73% | 59% |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

: = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | WESTBAY | MDMW-1-R1 | MDMW-1-R2 | MDMW-1-R3 | MDMW-1-R4 |
|--------------------------------|----------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| | | 1ST QTR DBH QA/QC | 1ST QTR DBH QA/QC | 2ND QTR DBH QA/QC | 3RD QTR DBH QA/QC | 4TH QTR DBH QA/QC |
| 1 BIS(2-CHLOROETHYL)ETHER | .5 | ND | ND | ND | ND | ND |
| 2 1,3-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND |
| 3 1,4-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND |
| 4 1,2-DICHLOROBENZENE | .5 | ND | ND | ND | ND | ND |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 2.0 | ND | ND | ND | ND | ND |
| 6 HEXACHLOROETHANE | 2.0 | ND | ND | ND | ND | ND |
| 7 N-NITROSODI-N-PROPYLAMINE | 5.0 | ND | ND | ND | ND | ND |
| 8 NITROBENZENE | .5 | ND | ND | ND | ND | ND |
| 9 ISOPHORONE | .5 | ND | ND | ND | ND | ND |
| 10 BIS(2-CHLOROETHOXY)METHANE | .5 | ND | ND | ND | ND | ND |
| 11 1,2,4-TRICHLOROBENZENE | 1.0 | ND | ND | ND | ND | ND |
| 12 NAPHTHALENE | .5 | ND | ND | 4.5 | ND | ND |
| 13 HEXACHLOROBUTADIENE | 2.0 | ND | ND | ND | ND | ND |
| 14 2-METHYLNAPHTHALENE | .5 | ND | ND | 5.9 | ND | ND |
| 15 1-METHYLNAPHTHALENE | .5 | ND | ND | 5.2 | ND | ND |
| 16 HEXACHLOROCYCLOPENTADIENE | 2.0 | ND | ND | ND | ND | ND |
| 17 2-CHLORONAPHTHALENE | .5 | ND | ND | ND | ND | ND |
| 18 ACENAPHTHYLENE | .5 | ND | ND | ND | ND | ND |
| 19 DIMETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND |
| 20 2,6-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND |
| 21 ACENAPHTHENE | .5 | ND | ND | ND | ND | ND |
| 22 2,4-DINITROTOLUENE | 2.0 | ND | ND | ND | ND | ND |
| 23 FLUORENE | .5 | ND | ND | ND | ND | ND |
| 24 4-CHLOROPHENYL PHENYL ETHER | 1.0 | ND | ND | ND | ND | ND |
| 25 DIETHYL PHTHALATE | .5 | ND | ND | ND | ND | ND |
| 26 N-NITROSODIPHENYLAMINE | .5 | ND | ND | ND | ND | ND |
| 27 AZOBENZENE | .5 | ND | ND | ND | ND | ND |
| 28 4-BROMOPHENYL PHENYL ETHER | 2.0 | ND | ND | ND | ND | ND |
| 29 HEXACHLOROBENZENE | 2.0 | ND | ND | ND | ND | ND |
| 30 PHENANTHRENE | .5 | ND | ND | 8.3 | ND | ND |
| 31 ANTHRACENE | .5 | ND | ND | ND | ND | ND |
| 32 DI-N-BUTYL PHTHALATE | .5 | 25.9 | 15.5 | 0.6 | ND | ND |
| 33 FLUORANTHENE | .5 | ND | ND | ND | ND | ND |
| 34 BENZIDINE | 15.0 | ND | ND | ND | ND | ND |
| 35 PYRENE | .5 | ND | ND | ND | ND | ND |
| 36 BENZYL BUTYL PHTHALATE | 2.0 | 9.4 | ND | ND | ND | ND |
| 37 BENZO(A)ANTHRACENE | 1.0 | ND | ND | ND | ND | ND |
| 38 CHRYSENE | 1.0 | ND | ND | ND | ND | ND |
| 39 3,3'-DICHLOROBENZIDINE | 5.0 | ND | ND | ND | ND | ND |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 1.0 | 6.6 | ND | ND | ND | ND |

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BASE-NEUTRAL EXTRACTABLES RESULTS

ND = NOT DETECTED

: = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | WESTBAY | MDMW-1-B7 | MDMW-1-R2 | MDMW-1-R3 | MDMW-1-R4 |
|---------------------------|----------------|-----------|-----------|-----------|-----------|-----------|
| | | 1ST QTR | 1ST QTR | 2ND QTR | 3RD QTR | 4TH QTR |
| | | DBH QA/QC | DBH QA/QC | DBH QA/QC | DBH QA/QC | DBH QA/QC |
| 41 DI-N-OCTYL PHTHALATE | 1.0 | 1.2 | 1.1 | ND | ND | ND |
| 42 BENZO(B)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND |
| 43 BENZO(K)FLUORANTHENE | 1.0 | ND | ND | ND | ND | ND |
| 44 BENZO(A)PYRENE | 2.0 | ND | ND | ND | ND | ND |
| 45 INDENO(1,2,3-CD)PYRENE | 2.0 | ND | ND | ND | ND | ND |
| 46 DIBENZO(A,H)ANTHRACENE | 2.0 | ND | ND | ND | ND | ND |
| 47 BENZO(GHI)PERYLENE | 2.0 | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

AMOUNT

| | | | | | | |
|---------------------|---------|------|-----|----|-----|-----|
| 48 NITROBENZENE-D5 | 50 UG/L | 39% | 51% | -- | 19% | 40% |
| 49 2-FLUOROBIPHENYL | 50 UG/L | 46% | 58% | -- | 18% | 47% |
| 50 4-TERPHEENYL-D14 | 50 UG/L | 225% | 84% | -- | 46% | 87% |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | 1-R3 3RD QTR |
|--------------------------------|----------------|-----------------|
| 1 BIS(2-CHLOROETHYL)ETHER | 50.0 | 83 |
| 2 1,3-DICHLOROBENZENE | 50.0 | 71 |
| 3 1,4-DICHLOROBENZENE | 50.0 | 72 |
| 4 1,2-DICHLOROBENZENE | 50.0 | 71 |
| 5 BIS(2-CHLOROISOPROPYL)ETHER | 50.0 | 80 |
| 6 HEXACHLOROETHANE | 50.0 | 78 |
| 7 N-NITROSODI-N-PROPYLAMINE | 50.0 | 75 |
| 8 NITROBENZENE | 50.0 | 102 |
| 9 ISOPHORONE | 50.0 | 107 |
| 10 BIS(2-CHLOROETHOXY)METHANE | 50.0 | 70 |
| 11 1,2,4-TRICHLOROBENZENE | 50.0 | 65 |
| 12 NAPHTHALENE | 50.0 | 66 |
| 13 HEXACHLOROBUTADIENE | 50.0 | 53 |
| 14 2-METHYLNAPHTHALENE | 50.0 | 73 |
| 15 1-METHYLNAPHTHALENE | 50.0 | 72 |
| 16 HEXACHLOROCYCLOPENTADIENE | 50.0 | 28 |
| 17 2-CHLORONAPHTHALENE | 50.0 | 71 |
| 18 ACENAPHTHYLENE | 50.0 | 61 |
| 19 DIMETHYL PHTHALATE | 50.0 | 43 |
| 20 2,6-DINITROTOLUENE | 50.0 | 73 |
| 21 ACENAPHTHENE | 50.0 | 61 |
| 22 2,4-DINITROTOLUENE | 50.0 | 77 |
| 23 FLUORENE | 50.0 | 60 |
| 24 4-CHLOROPHENYL PHENYL ETHER | 50.0 | 52 |
| 25 DIETHYL PHTHALATE | 50.0 | 48 |
| 26 N-NITROSODIPHENYLAMINE | 50.0 | 56 |
| 27 AZOBENZENE | 50.0 | 74 |
| 28 4-BROMOPHENYL PHENYL ETHER | 50.0 | 56 |
| 29 HEXACHLOROBENZENE | 50.0 | 60 |
| 30 PHENANTHRENE | 50.0 | 66 |
| 31 ANTHRACENE | 50.0 | 67 |
| 32 DI-N-BUTYL PHTHALATE | 50.0 | 50 |
| 33 FLUCRANTHENE | 50.0 | 73 |
| 34 BENZIDINE | 50.0 | |
| 35 PYRENE | 50.0 | 84 |
| 36 BENZYL BUTYL PHTHALATE | 50.0 | 81 |
| 37 BENZO(A)ANTHRACENE | 50.0 | 82 |
| 38 CHRYSENE | 50.0 | 78 |
| 39 3,3'-DICHLOROBENZIDINE | 50.0 | 44 |
| 40 BIS(2-ETHYLHEXYL)PHTHALATE | 50.0 | 91 |

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SPIKED BASE-NEUTRAL SAMPLES - PERCENT RECOVERIES (CONTINUE)

| COMPOUND | AMOUNT US/L | 1-R3 3RD QTR |
|--------------------------------|----------------|-----------------|
| 41 DI-N-OCTYL PHTHALATE | 50.0 | 91 |
| 42 BENZO(B)FLUORANTHENE | 50.0 | 84 |
| 43 BENZO(K)FLUORANTHENE | 50.0 | 88 |
| 44 BENZO(A)PYRENE | 50.0 | 91 |
| 45 INDENO(1,2,3-CD)PYRENE | 50.0 | 90 |
| 46 DIBENZO(A,H)ANTHRACENE | 50.0 | 82 |
| 47 BENZO(GHI)PERYLENE | 50.0 | 92 |
| SURROGATE STANDARD RECOVERIES: | | |
| | AMOUNT | |
| 48 NITROBENZENE-D5 | 50 US/L | 89 |
| 49 2-FLUOROBIPHENYL | 50 US/L | 146 |
| 50 4-TERPHENYL-D14 | 50 US/L | 80 |

APPENDIX K4

Borehole MDMW-1
Acid Extractables

Analyses by:

Barringer-Magenta Ltd.
Rexdale, Ontario

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| | COMPOUND | M.D.L. | MD-1 | MDMLS-1 | MDMLS-2 | 1-61.5M | 1-61.5M | 1-61.5M |
|----|----------------------------|--------|--------------------|---------|---------|-------------------|---------|-------------------|
| | | UG/L | 1ST QTR DF=1000 | 1ST QTR | 1ST QTR | 2ND QTR DF=1.6 | 3RD QTR | 4TH QTR DF=1.6 |
| 1 | PHENOL | .5 | 2400.0 | 129.0 | 2.6 | 2290.0 | 1010.0 | 2480.0 |
| 2 | 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND |
| 3 | 2-NITROPHENOL | 2.0 | ND | 2.2 | ND | ND | ND | ND |
| 4 | 2,4-DIMETHYLPHENOL | 1.0 | ND | 6.7 | ND | 45.8 | 26.9 | 17.7 |
| 5 | 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND |
| 6 | 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | 6.6 | ND | ND | ND |
| 7 | 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND |
| 8 | 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 9 | 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 10 | 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 11 | PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|----|--------------------------|---------|----|-----|-----|-----|-----|-----|
| 12 | A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | -- | 55% | 20% | -- | 3% | 57% |
| 13 | 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | -- | -- | 69% | 51% | 70% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. | 1-75M | 1-75M | 1-75M DUPL | 1-75M | 1-75M | 1-123M |
|-------------------------------|--------|-------------------|------------------|------------------|---------|-------------------|-------------------|
| | UG/L | 1ST QTR DF=100 | 2ND QTR DF=16 | 2ND QTR DF=10 | 3RD QTR | 4TH QTR DF=1.6 | 1ST QTR DF=100 |
| 1 PHENOL | .5 | 2290.0 | 1240.0 | 958.0 | 1280.0 | 6120.0 | 1310.0 |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | 18.8 | ND | 25.1 | 21.4 | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | |
|-----------------------------|---------|----|----|----|-----|-----|----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | -- | -- | -- | 8% | 66% | -- |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | -- | -- | -- | 56% | 70% | -- |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-123M 3RD QTR | 1-123M 4TH QTR DF=1.6 | 1-123M DUP 4TH QTR DF=1.33 | 1-180M 1ST QTR DF=100 | 1-180M 2ND QTR DF=40 | 1-192.5M 1ST QTR DF=100 | 1-192M 2ND QTR DF=16 |
|-------------------------------|----------------|-------------------|-----------------------------|----------------------------------|-----------------------------|----------------------------|-------------------------------|----------------------------|
| 1 PHENOL | .5 | 1510.0 | 4420.0 | 4560.0 | 1640.0 | 3080.0 | 31000.0 | 30900.0 |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | 28.9 | 49.7 | 48.6 | ND | ND | ND | 922.0 |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|------|------|----|----|----|----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 12% | 102% | 113% | -- | -- | -- | -- |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 57% | 84% | 61% | -- | -- | -- | -- |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

* = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-192.5M 3RD QTR | 1-192M 4TH QTR DF=16 | 1-207M 1ST QTR DF=7.5 | 1-207M 2ND QTR DF=114 | 1-207M 3RD QTR | 1-207M 4TH QTR DF=1.33 | 1-229M 3RD QTR |
|-------------------------------|----------------|---------------------|----------------------------|-----------------------------|-----------------------------|-------------------|------------------------------|-------------------|
| 1 PHENOL | .5 | 37400.0 | 39700.0 | 132.0 | ND | 90.7 | 206.0 | 5.5 |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | 1020.0 | 830.0 | ND | ND | 8.1 | 9.2 | 3.5 |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | | | |
|-----------------------------|---------|-----|----|-----|----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 55% | -- | 63% | -- | 31% | 56% | 42% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 88% | -- | 71% | -- | 31% | 65% | 14% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

1 \pm COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. UG/L | 1-228M 4TH QTR | 1-240M 1ST QTR DF=7.5 | 1-240M 4TH QTR DF=1.33 | 1-271.5M 1ST QTR DF=7.5 | 1-291M 1ST QTR DF=7.5 |
|-------------------------------|----------------|-------------------|-----------------------------|------------------------------|-------------------------------|-----------------------------|
| 1 PHENOL | .5 | 3.9 | ND | 2.3 | ND | 5.2 |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | 2.0 | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND |
| 11 PENTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L | 54% | 37% | 48% | 65% | 28% |
| 13 1,2,3-TRIBROMOPHENOL | 50 UG/L | 55% | 50% | 47% | 57% | 50% |

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ACID-EXTRACTABLES RESULTS

ND = NOT DETECTED

+ = COMPOUND DETECTED AT A LEVEL BELOW THE STATED M.D.L.

| COMPOUND | M.D.L. US/L | WESTBAY | MDMW-1-R1 | MDMW-1-R2 | MDMW-1-R3 | MDMW-1-R4 |
|-------------------------------|----------------|-----------|-----------|-----------|-----------|-----------|
| | | 1ST QTR | 1ST QTR | 2ND QTR | 3RD QTR | 4TH QTR |
| | | DBH QA/QC | DBH QA/QC | DBH QA/QC | DBH QA/QC | DBH QA/QC |
| 1 PHENOL | .5 | ND | ND | 0.6 | ND | ND |
| 2 2-CHLOROPHENOL | 1.0 | ND | ND | ND | ND | ND |
| 3 2-NITROPHENOL | 2.0 | ND | ND | ND | ND | ND |
| 4 2,4-DIMETHYLPHENOL | 1.0 | ND | ND | ND | ND | ND |
| 5 2,4-DICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND |
| 6 4-CHLORO-3-METHYL PHENOL | 15.0 | ND | ND | ND | ND | ND |
| 7 2,4,6-TRICHLOROPHENOL | 10.0 | ND | ND | ND | ND | ND |
| 8 2,4-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND |
| 9 4-NITROPHENOL | 15.0 | ND | ND | ND | ND | ND |
| 10 2-METHYL-4,6-DINITROPHENOL | 15.0 | ND | ND | ND | ND | ND |
| 11 PERTACHLOROPHENOL | 15.0 | ND | ND | ND | ND | ND |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | | | | | |
|-----------------------------|---------|-----|-----|-----|-----|-----|
| 12 A,A,A-TRIFLUORO-M-CRESOL | 50 US/L | 71% | 49% | -- | 14% | 41% |
| 13 1,2,3-TRIBROMOPHENOL | 50 US/L | 59% | 51% | 65% | 7% | 52% |

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SPIKED ACID EXTRACTABLES SAMPLES - PERCENT RECOVERY

| COMPOUND | AMOUNT UG/L | 1-R3 3RD QTR |
|----------|----------------|-----------------|
|----------|----------------|-----------------|

| | | | |
|----|----------------------------|------|----|
| 1 | PHENOL | 50.0 | 67 |
| 2 | 2-CHLOROPHENOL | 50.0 | 76 |
| 3 | 2-NITROPHENOL | 50.0 | 73 |
| 4 | 2,4-DIMETHYLPHENOL | 50.0 | 29 |
| 5 | 2,4-DICHLOROPHENOL | 50.0 | 65 |
| 6 | 4-CHLORO-3-METHYL PHENOL | 50.0 | 69 |
| 7 | 2,4,6-TRICHLOROPHENOL | 50.0 | 61 |
| 8 | 2,4-DINITROPHENOL | 50.0 | 41 |
| 9 | 4-NITROPHENOL | 50.0 | 46 |
| 10 | 2-METHYL-4,6-DINITROPHENOL | 50.0 | 71 |
| 11 | PENTACHLOROPHENOL | 50.0 | 57 |

SURROGATE STANDARD RECOVERIES:

| | AMOUNT | |
|----|--------------------------|------------|
| 12 | A,A,A-TRIFLUORO-M-CRESOL | 50 UG/L <1 |
| 13 | 1,2,3-TRIBROMOPHENOL | 50 UG/L 32 |

APPENDIX K5

Borehole MDMW-1
Organochlorine Compounds

Analyses by:

Barringer-Magenta Ltd.
Rexdale, Ontario

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

= CALCULATED FROM ONE COLUMN

= COULD NOT BE CALCULATED

| COMPOUND | M.D.L. | MD-1 | MDMS-1 | MDMS-1 | MDMS-2 | 1-61.5M | 1-61.5M | 1-61.5M |
|---------------------|--------|---------|---------|----------------------|---------|-------------------|---------|---------|
| | US/L | 1ST QTR | 1ST QTR | 1ST QTR QC-REPEAT | 1ST QTR | 2ND QTR DF=100 | 3RD QTR | 4TH QTR |
| 1 HEXACHLOROBENZENE | .0010 | #.0000 | #.0000 | #.0000 | #.0060 | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | 0.0016 |
| 3 ALDRIN | .0005 | #.0031 | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | 1-75M | 1-75M DUPL | 1-75M | 1-75M | 1-123M | 1-123M | 1-123M |
|---------------------|----------------|-------------------|------------------|---------|---------|--------------------|---------|---------|
| | | 2ND QTR DF=100 | 2ND QTR DF=10 | 3RD QTR | 4TH QTR | 2ND QTR DF=1000 | 3RD QTR | 4TH QTR |
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | 1-123M DUP 4TH QTR | 1-180M 1ST QTR DF=20000 | 1-192.5M 1ST QTR DF=1000 | 1-192M 2ND QTR DF=1000 | 1-192.5M 3RD QTR | 1-192M 4TH QTR | 1-207M 1ST QTR DF=1000 |
|---------------------|----------------|-----------------------|-------------------------------|--------------------------------|------------------------------|---------------------|-------------------|------------------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. UG/L | 1-207M 2ND QTR DF=1000 | 1-207M 3RD QTR | 1-207M 4TH QTR | 1-229M 3RD QTR | 1-229M 4TH QTR | 1-240M 4TH QTR |
|---------------------|----------------|------------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 1 HEXACHLOROBENZENE | .0010 | ND | ND | ND | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | ND | ND | ND | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND | ND |

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ORGANOCHLORINE COMPOUNDS RESULTS

ND = NOT DETECTED

* = AMOUNT CALCULATED FROM A SINGLE COLUMN

| COMPOUND | M.D.L. US/L | WESTBAY | MDMW-1-R1 | MDMW-1-R2 | MDMW-1-R3 | MDMW-1-R4 |
|---------------------|----------------|-----------|-----------|-----------|-----------|-----------|
| | | 1ST QTR | 1ST QTR | 2ND QTR | 3RD QTR | 4TH QTR |
| | | DBH QA/QC | DBH QA/QC | DBH QA/QC | DBH QA/QC | DBH QA/QC |
| 1 HEXACHLOROBENZENE | .0010 | 0.0010 | *.0024 | ND | ND | ND |
| 2 HEPTACHLOR | .0005 | ND | ND | ND | ND | ND |
| 3 ALDRIN | .0005 | ND | 0.0011 | *.0030 | ND | ND |
| 4 OCTACHLOROSTYRENE | .0010 | ND | ND | ND | ND | ND |
| 5 PP'-DDE | .0005 | ND | ND | ND | ND | ND |
| 6 MIREX | .0010 | ND | ND | ND | ND | ND |
| 7 TOTAL PCB'S | .0100 | ND | ND | ND | ND | ND |

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SPIKED ORGANOCHLORINE SAMPLES - PERCENT RECOVERIES

| COMPOUND | AMOUNT UG/L | 1-R3 3RD QTR |
|---------------------|----------------|-----------------|
| 1 HEXACHLOROBENZENE | 0.0250 | |
| 2 HEPTACHLOR | 0.0250 | |
| 3 ALDRIN | 0.0250 | |
| 4 OCTACHLOROSTYRENE | 0.0250 | |
| 5 PP'-DDE | 0.0250 | |
| 6 MIREX | 0.0700 | |
| 7 TOTAL PCB'S | 0.2500 | 100 |



